Celebration Station # 10 / Tulsa, Ok.

Daniel & the Dixie Diggers w/Jethro

Operating and Maintenance Manual

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How to Use this Manual

The *Sally Operating and Maintenance Manual* was written to assist our clients in understanding how our audio animated characters and productions function. While the subject matter is technical, every effort has been made to make this manual easily understood and useful.

This guide is divided into three primary sections - Operations, Installation, and Maintenance.

In the *Appendix* you will find important information specifically about the equipment you purchased. This information was prepared for you during manufacturing.

If you have questions not covered in this manual or if you find the information unclear, we encourage you to call our *Customer Service Department.*

- ☞ *Customer Service Department* hours: Monday - Friday, 8:00 a.m.-5:00 p.m. E.S.T.
- ☞ *Customer Service Hotline*: (904)353-8927
- ☞ Main business line: (904)353-5051
- ☞ After business hours - voice mail: (904)443-6900

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Need to Modify Accordingly

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off. The term "switch" is appropriate. The ACS turns on the valve for a specified length of time to allow air to flow to the cylinder which in turn creates the movement. Sometimes, however, the computer switches on or off a relay which in turn controls lighting, motors or other effects that usually require stronger electrical currents to operate.

The ACS can also be programmed to start the animated character or production at a certain time, control the audio source and perform a variety of other show control functions.

The ACS has other features which may include editing, voice-activation and timing among others.

Summary

Making a robot talk or move is a matter of instructing compressed air which cylinders to turn on and off and when they should make their move. Those instructions are usually prerecorded along with the robot's sound track on tape or stored in some other audio source. When the audio source is initiated, the commands to control the air flow are received by the Animation Control Computer which activates the valves to let air flow to the cylinders. See Figure I-1.

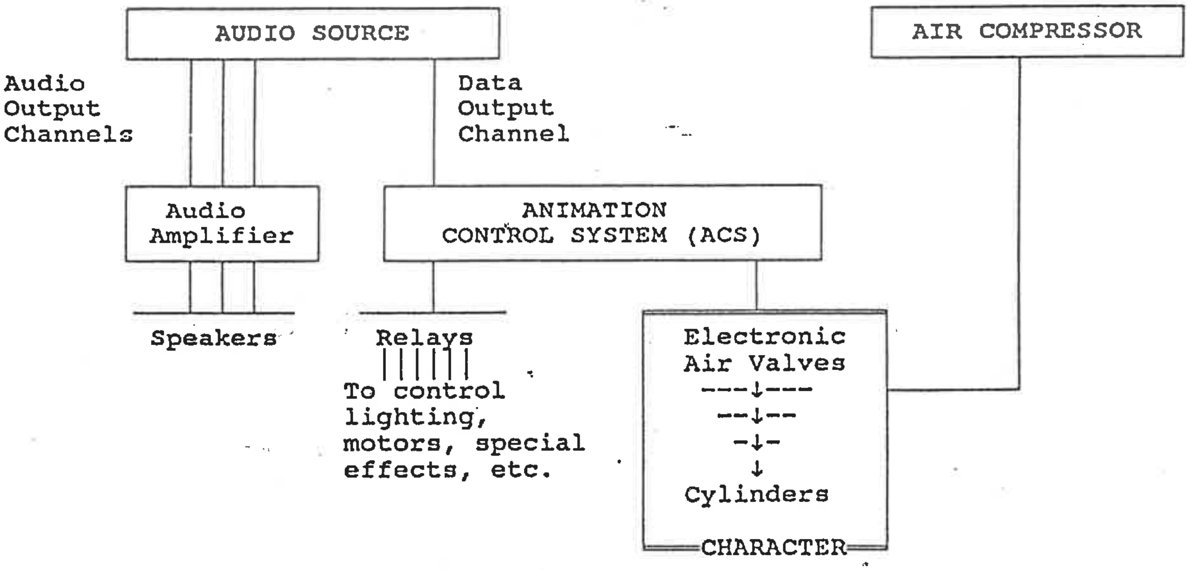


Fig. I-1
Block Diagram of Animated Character Control

Section II
Operating Instructions

The Air System

Why Compressed Air? For a number of reasons, compressed air is the most commonly used source of power for animation. Air is free. Air is clean. Air-activated cylinders are small and compact. Pneumatic (air) components are readily available worldwide. Electrical codes generally do not apply because conduit is not usually needed. There is no danger of electrical shock. Pneumatic operation is easy to understand. Most importantly, it is reliable.

AIR COMPRESSOR

Depending on your system, an air compressor of a specific size are included in the basic package of equipment needed to operate an animated show. The air compressors are specified according to the required horsepower and capacity required to provide the proper level of air pressure and volume needed to power the character and other special equipment.

Often an attached or adjacent air storage tank is part of the system. The tank holds a ready reserve of pressurized air. The compressor automatically keeps the tank charged with enough air to maintain the proper pressure and volume.

√ For detailed information about the compressor and tank supplied with your system, refer to the *Appendix* of this manual.

IMPORTANT NOTE: Because the air compressor uses an induction motor, it is important that the compressor be assigned to an electrical circuit separate from the one used for the Animation Control System and audio equipment.

DRYER

Some air systems require a device to dry the air. Moist or damp air causes rust and clogging of the delicate valves and cylinders. It is important that the air being sent to the animated characters remain filtered and clean as well as free of moisture.

√ For detailed information about the dryer supplied (if any) with your system, refer to the *Appendix* of this manual.

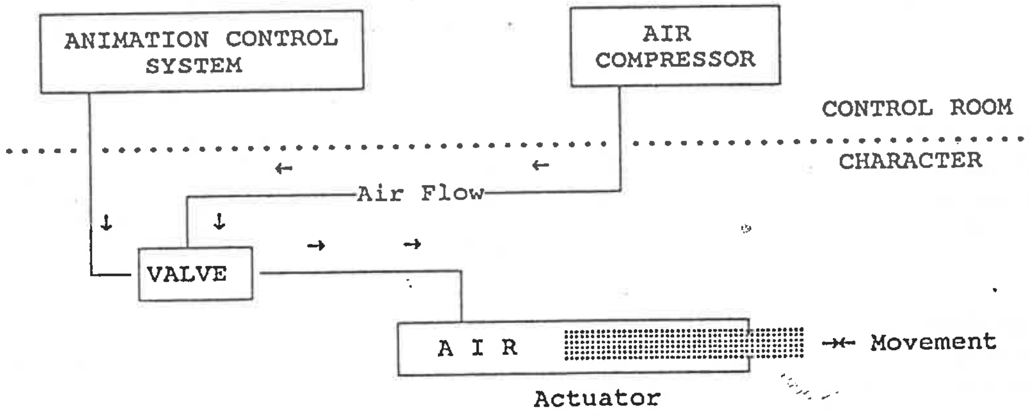


Figure II-1 Block Diagram of Basic Air System

PRESSURE/REGULATORS

Another important part of the pneumatic system is air pressure. Pressure is the *force* of the air. Air is pressurized by a compressor and usually stored in a tank. The pressurized air is regulated both at the compressor and at the animation. The regulator on the compressor should initially be set at about 110-120 psi (pounds per square inch). If the distance between the compressor and the animation is significant, higher pressures may be required to overcome the drop in pressure in the long air lines.

At the character, the main air line from the compressor is split into two or more air lines, each individually regulated.

- HIGH PRESSURE LINE (white)

The *white* air line is regulated to about 90 psi and is routed to the valve boards. This line is referred to as the *high pressure line*. The high pressure line provides the source of power for the primary movement when activated by the valve.

- BACK PRESSURE LINE (gray)

The *gray* lines provide low pressure to the cylinders and are referred to as the *back pressure* lines. Back pressure is usually regulated to about 45 psi. If there were no outside forces acting upon the animation, only one back pressure line would be needed. However, an arm movement requires less applied force to move downward than upward because of gravity. In this instance, the downward back pressure needs to be reduced to produce a movement of the same force as the upward movement. This back pressure might be adjusted to about 30 psi.

Movements requiring similar back pressures are grouped together on a single regulator. Each character may have three or four regulators for different levels of back pressures. Since all high pressures are relatively constant, only one regulator is generally required.

The Audio System

The audio system may be made up of many components and configured in many ways. Because most of the audio equipment supplied with your animatronic package is manufactured by other companies we generally include the operating and maintenance manuals provided by those manufacturers. These manuals are either packed with the audio equipment or are included in the *Appendix* of this manual.

AUDIO SOURCE

The audio source usually provides both the source of the character's sound as well as the animation control information or data used to instruct the computer as to what mechanical and electrical functions should be controlled.

Each of these sound sources are carried on different channels.

Example: Channel 1 may be the data channel, Channel 2 may be the character's voice, Channel 3 could be the music background, Channel 4 might be another music channel or sound effects, etc.

The data channel would be directly connected to the Animation Control System (ACS) where the information is decoded.

The other audio channels would connected to audio mixers, noise filters, amplifiers and speakers. Sometimes the mixers, amplifiers and even speakers are contained in the same piece of equipment.

The audio source itself could be any one of the following equipment types: cassette or reel-to-reel multi-channel tape recorders, solid state digital memory storage, compact disc (CD), optical laser disk or even video tape (VTR/VCR).

√ You should refer to the manuals provided with the specific audio equipment provided with your system. You will find this information in the *Appendix* of this manual.

AUDIO AMPLIFIER

Depending on the number of characters, size of the show and its location, the audio output from the audio source may need to be amplified. Separate amplifiers (stereo or monaural) may be included in your system.

In the case of the ACS-50 Animation Control System, a built-in 10-watt audio amplifier is included as part of the unit.

It is important that great care be taken in controlling the loudness of the show's sound track. Adjust the level only loud enough to make sure that the intended audience can comfortably hear and understand but not so loud as to sound unnatural or distorted.

√ For specific information about the installation and operation of a separate audio amplifier system, refer to the *Appendix* of this manual.

NOISE REDUCTION

In some cases it is necessary for the audio system to include a device that reduces or filters out certain distracting noises produce by the surface of audio tape and other sound storage media. This is often referred to a DBX or Dolby noise reduction systems.

√ If a noise reduction device is specified for your show, refer to the *Appendix* of this manual for information about its proper installation and operation.

SPEAKERS

The audio speakers may be large stereo-type speakers capable of filling an entire theater with sound. The audio speakers may also be smaller units strategically placed or concealed adjacent to the animated characters. Often individual speakers are placed inside the animated characters usually in the upper chest area.

The Animation Control System

OVERVIEW

In reality the *Animation Control System* (ACS) is a specially designed computer used to orchestrate the movements of an animated character. But, the ACS also switches on or off special effects, lighting and other show elements such as curtains and the audio source.

The ACS accomplishes this by *decoding* or translating synchronized information (data) being sent to it from the audio source. The data is usually synchronized and recorded at the factory prior to shipment of the equipment. However, sometimes the data is recorded or edited during installation or afterwards by the client. As the data is decoded, the ACS is then able to determine which valves should be switched on or off and what other elements must be called into action.

Now that you have installed (See *Section III - Installation*) and verified all the connections to your ACS, the system will control the animation from data it receives from one channel of the audio source. Some types of ACS can also be operated manually for live action.

NOTE: The term *audio source* refers to any one of the following devices used to record and playback audio: cassette or reel-to-reel tape machines, digital memory sound storage, compact discs (CD), optical laser disk or video disk recorder. The most common audio source is a cassette or reel-to-reel tape recorder.

Sally Animation Control Systems

Your purchase of animated equipment may include a *Sally* Animation Control System such as an ACS-2000 series or ACS-50. However, in some specific applications animation control equipment manufactured by other companies may be a part of your system.

Sally animatronic systems are designed to work with a broad range of Sally and other animation control units.

The operation and maintenance information for your specific control system is included in the following pages of Section II of this Sally manual.

Sally Industries, Inc.

ACS-2000 Series Operating Manual

ACS-2000 Series Operating Manual

DESCRIPTION OF ACS-2000 SERIES

The ACS-2000 Series is a specially designed animation control computer. It is both a playback and programming control unit. Depending upon your specific application, your ACS-2000 may be configured at the factory to control 32, 64 or 128 channels or circuits.

Each channel is a separate circuit which can be turned on or off by the computer. Thus the ACS is capable of controlling up to 128 digital movements or special effects or any combination. The ACS-2000 also can be configured to control up to 16 analog functions. Those control channels may be attached to such things as an animated character's cylinders, lighting circuits, curtain motors, smoke machines or any variety of devices needing to be synchronized with the animatronic production.

In addition, the ACS-2000 can either automatically or manually control the operation of the audio equipment such as starting, stopping and rewinding a tape recorder.

The ACS-2000 also features a motion sequencer, *AutoVox*--a voice-activated movement control, clock, and a between-show timer. Each of those functions are described below.

The ACS-2000 Series is composed of two separate units--*CPU* and *Keyboard/Display*. Figure II-1 depicts the *Active Program Display* which appears in the upper left of the separate keyboard unit. Figure II-2 shows the general keyboard functional layout.

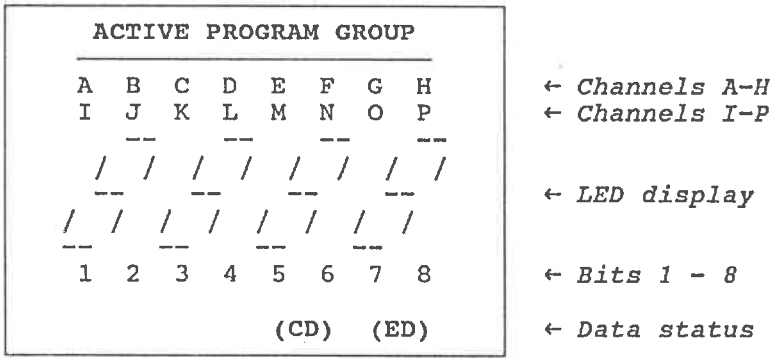


Figure II-1. ACS-2000 Display Panel

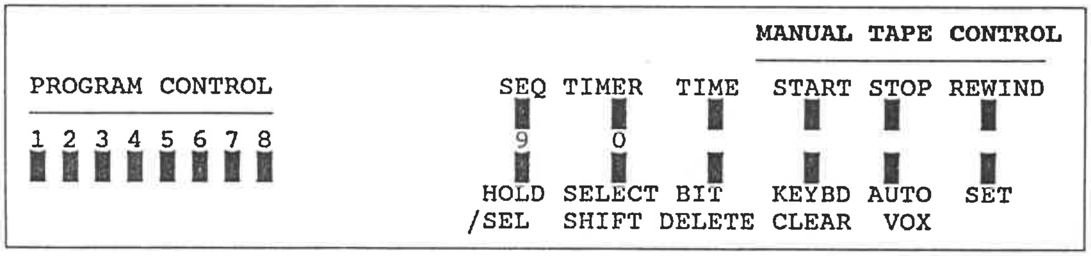


Figure II-2. ACS-2000 Keyboard

- **CPU UNIT:** The main housing contains the central processing unit (CPU), output channel switching cards, power supplies, and an audio decoder. The unit may be self-contained in its own cabinet or mounted in a standard 19-inch equipment rack.
- **KEYBOARD/DISPLAY:** The separate keyboard contains switches or buttons (*Program Control* keys) to set or control various functions of the ACS. There is also a display panel (*Active Program Display*) which visually shows in real time what functions are being activated or controlled.

ACTIVE PROGRAM DISPLAY

The upper left portion of the ACS-2000 keyboard displays the *Active Program Group*. This segmented LED display illustrates what channels are being activated by the ACS. In addition, two key indicator lights report the status and condition of the synchronization data being received from the audio source. The *Carrier Detect* (CD) and *Error Detect* (ED) indicators report to the operator if the incoming data is suitable for decoding. (See *Carrier Detect* and *Error Detect* below)

The 128 control bits are segmented into 16, eight-bit channels identified by the letters A-P. The *Active Program Group* letter is a backlighted LED segment.

PROGRAM CONTROL KEYS

On the lower left side of the ACS-2000 keyboard are eight buttons referred to as ***Program Control*** keys. These buttons activate each show signal and perform other functions which are discussed later.

On the lower right side of the keyboard are two rows of buttons that determine the ACS-2000 operation mode. Each button or switch has a specific function, e.g., sequencing, automatic mouth control, manual audio source control, etc. These functions are discussed in detail later.

The *Program Control* keys activate the eight bits of whichever channel you have selected. Consult your *Grid Sheet* in the *Appendix* to determine the specific assignments for your system.

Carrier Detect

If the ACS-2000 and the audio source are connected properly, the *CARRIER DETECT (CD)* light on the upper panel illuminates. This light illuminates whenever the ACS is receiving properly formatted information from the audio source for decoding.

Error Detect

If the *ERROR DETECT (ED)* light illuminates, this means the data being received by the ACS is unintelligible and cannot be decoded properly. Check cable connections on the rear of the ACS and the audio source. Verify that the tape or audio source has valid information.

MANUAL TAPE CONTROL

The tape recorder or other audio source may be remotely controlled manually from the ACS-2000 operating panel. Here is a description of what each switch performs.

STOP will stop the audio source and the program.
START will start the audio source and the program.
REWIND will stop the program and start the rewinding of a tape recorder.

These same switches may be assigned to perform similar functions for non-audio tape sources.

TIME OF DAY

▪ VIEWING THE TIME OF DAY

Press the *TIME* button. The switch latches on and the LED remains lighted. The time is displayed on the *Active Program Group* Panel. It is a good preventative maintenance procedure to check the clock periodically to determine its accuracy or possible battery failure.

▪ SETTING THE TIME OF DAY

Setting the time of day should be done upon the initial installation. Normally it is not necessary to reset the ACS-2000's internal clock because the clock is protected by a back-up battery.

Note: Be sure the *SEQ*uencer and *TIMER* buttons are NOT depressed.

Depress the *TIME* and *SET* buttons. The LED on each button activates, and the keyboard/display panel reads: *0000.*

Using the *Program Control* keys, enter the time in hours and minutes (Note: use the *HOLD/SEL*ect and the *SELECT/SHIFT* keys for the numerals *9* and *0*, respectively). The time must be entered in military time, using a 24 hour clock.

Example: 2:50 pm is 14:50 hours. It is entered by using *Program Control* keys *1,4,5,0.*

Once the time is set, depress the *SET* button again to unlatch it, and the clock begins keeping the newly set time.

TIMER

The *TIMER* sets the length of time from the end of a program to the beginning of the next program. It can be set for any length of time up to 59 minutes and 59 seconds. The timer is activated whenever the *TIMER* button is depressed and the LED indicator on the button is lit. The timer begins its countdown when the audio source is stopped or in rewind. The audio source is automatically started when the countdown is complete. When the audio source stops again or goes into rewind, the counter will re-set and resume its count.

NOTES:

1. The *Time of Day* must be set before the *Timer* will function.
2. When setting the timer, be sure to allow enough time for the tape to completely rewind or for the audio source to reset. Otherwise, the program will not start at its beginning.

SETTING THE TIMER

Be sure the *SEQ*uence button is NOT depressed. Otherwise, you will be setting the sequencer rather than setting the timer.

Depress the *TIMER* and *SET* buttons. The LED on each button activates and the keyboard/display panel displays: *0000.*

Using the *Program Control* keys, enter the desired time in minutes and seconds between show segments. (Note: Use the *HOLD/SEL*ect and the *SELECT/SHIFT* buttons for the numerals *9* and *0*, respectively).

Release the *SET* button. When the *TIMER* button is activated, the timer runs whenever the computer is not receiving data from the audio source. The timer issues a *START* command to the audio source after the preset time has lapsed.

Example: If the desired time between shows is 12 minutes and 45 seconds, enter *1,2,4,5*

RUNNING A PRERECORDED SHOW

Note: Before attempting to start a program turn on all electric power to the ACS-2000, audio equipment and air compressor.

AUDIO TAPE SOURCE

To playback a prerecorded tape place the cassette tape in the tape recorder or thread the reel-to-reel tape (See instructions for playing tape on your specific equipment in the *Appendix* of this manual). Press the *play* button on the tape recorder and observe the *(CD)* and *(ED)* lights on the display panel once the tape has sufficiently reached the recorded material. (See below)

OTHER AUDIO SOURCES

If your audio source is something other than a tape recorder, the principle remains the same. After the data channel is connected to the ACS and the other audio channels connected to amplifiers and speakers, then starting the audio source should produce the same results. (See the instructions for playing your specific audio source in the *Appendix* of this manual.)

LIVE OPERATION OF ANIMATION

Sally's animatronic systems not only operate from prerecorded synchronized audio but also permit manual or live operation of characters. In some instances, character's are specified to have an *AutoVox* feature which allows for automatic, live mouth movement.

The ACS-2000 can, at any time, manually operate any movement from the keyboard. This manual operation feature makes live operation easier and also permits testing and adjustment of character's after installation

AutoVox ™

Using *AutoVox* allows you to speak into a microphone and have your voice come from the character while the character's animated mouth moves in synchronization to your words. *AutoVox* only affects the mouth movement. If you want to create other animated movements such as eye blink, head turn, arms, etc. then you should operate those movements manually from the keyboard as you speak through the

- *AutoVox*. It is also possible to use *AutoVox* for the character's mouth movements while the rest of the character's animation comes from the prerecorded audio source. In this instance, *AutoVox* overrides any *programmed* mouth movement.

The *AutoVox* output is fed only to the character and can not be recorded onto tape during new show programming.

▸ VOXING A CHARACTER

Depressing the *AutoVox* button automatically activates this feature in the operate mode. The button latches on and the LED indicator remains lit. The *AutoVox* overrides any programmed mouth control from the audio source.

Connect a microphone to the microphone input jack on the front of the tape recorder or audio source. Use the audio channel that corresponds to the audio *input* on the rear panel of the ACS-2000.

Put a **blank** tape into the tape recorder and depress the *PLAY* and *RECORD*. **Do Not Use The Show Tape During Live Operation.**

Depress the *AutoVox* button on the ACS. When you speak into the microphone, the character's mouth operates in synchronization with the live voice. Speak clearly and distinctly. You may need to adjust the volume and the mouth response time by adjusting the *record* level on the audio source.

▪ LIVE MOVEMENT CONTROL

In addition to decoding information from the audio source to control the show or character, the ACS-2000 also *encodes* information. In other words, the ACS creates the same data that would be stored in an audio source. In this way the ACS-2000 is connected directly to the character allowing it to operate all of the movements, special effects, etc., manually. This is helpful in troubleshooting problems and allows for "live" interaction with the audience.

In the *Appendix* are the movements of your characters diagramed in an *ACS-2000 Grid Sheet* form. There is also a discussion of the *Grid Sheet* below which will help you to better understand the concept. In this way you are able to look up the address of each movement or element to be controlled. Therefore, when operating or programming the show you first must identify the address of the desired movement (using the grid sheet found in the *Appendix*) by determining the channel and bit address.

NOTE: The sequencer can be used to randomly move any other characters during live operation of the designated character.

On the right side of the ACS-2000 keyboard is a group of eight buttons referred to as *Program Control* keys. These eight buttons correspond to the eight bits of the matrix (see Figure II-1). By depressing these buttons, you activate bits 1-8 for whatever channel is active. The *Active Program Group* panel, located on the ACS-2000 upper keyboard, displays the active channels.

The uppermost section of the panel has two rows of letters (A-H and I-P) which refer to the *channels* of the matrix labeling system. The active channel is backlighted by an LED.

The *Program Control* keys may be pushed individually or at the same time.

▪ CHANGING THE CHANNEL

The ACS-2000 allows you to select any channel for operation. To change the channel, the *HOLD/SEL*ect and *SELECT/SHIFT* buttons are used simultaneously with the *Program Control* keys. When the *HOLD/SEL*ect button is depressed, the *Program Control* keys correspond to the upper channels, A-H. When both the *HOLD/SEL*ect and the *SELECT/SHIFT* keys are depressed, the *Program Control* keys correspond to the lower channels, I-P.

Selecting Channels A-H:

First depress and hold the *HOLD/SEL*ect key, then depress the *Program Control* key from 1 to 8 corresponding to the A to H channel. The display changes to the channel you selected.

The Lower 8 Channels

First depress and hold the *HOLD/SEL*ect and *SELECT/SHIFT* buttons, then depress a *Program Control* key from 1 to 8 corresponding to the I to P channel. The display changes to the channel you selected.

▪ GRID SHEET

Before you can operate the character or show, the movements (or other elements) must be identified in a manner that the ACS can understand. Consequently, a grid system is used to label each control element. Think of this grid as an unique address for each movement or control channel.

The 128 maximum outputs comprise a grid of sixteen *CHANNELS* of eight *BITS* each. Each movement or action in your show is assigned a two-part address code consisting of one channel and one bit.

In this manner, each movement is assigned a two bit address that can be understood by the ACS-2000.

BITS

CHANNELS	1	2	3	4	5	6	7	8
A	HEAD NOD							
B			EYE TURN					
C						ARM OUT		

Figure II-3. Sample ACS-2000 Grid Map

In the above example, the *Grid Sheet* indicates that the address for the character's head turn movement is Channel *A*, Bit *1*. Also on this matrix you will note that *B3* represents the eye turn movement and *C6* is the address for the character's arm-out motion.

SEQUENCER

The sequencer is a built-in ACS-2000 memory feature. It allows the characters to continue to move in a life-like manner whenever the ACS is not receiving a data from the audio source. The sequencer prevents the characters from going "dead" while the audio source is resetting or stopped.

Any of the 128 functions can be stored in the sequencer. You can program 30-seconds of movements and store the sequence in memory. When the audio source stops sending prerecorded data, then the sequencer takes over and keeps the characters moving according to the stored sequence. This sequence is repeated over and over until the audio source starts sending data again or the sequencer is turned off.

▪ ACTIVATING THE SEQUENCER

To activate the sequencer, depress the *SEQ* button on the ACS-2000 front panel. The button latches on and the LED illuminates.

The prerecorded data received from the audio source overrides *SEQ* programmed information.

▪ PROGRAMMING THE SEQUENCER

Select the channel you want to program in the same manner described in the *Changing the Channel* section above.

Depress the *SEQ* button; the LED illuminates. Depress the *SET* button; the LED illuminates. You are now ready to program the sequencer.

≡ Depress the *Program Control* buttons in the order you want the character to move. Program additional channels by selecting that channel and repeating the programming steps described above.

≡ You may continue to program additional information into the sequencer program indefinitely. None of the information programmed into the sequencer is erased, even if you continue beyond the 30 second repeat cycle. Thus, you can add different channels and bits of information on each 30 second cycle.

≡ After you have programmed a number of passes through the cycle, it's likely you may want to eliminate or edit some of the channels. To eliminate a particular channel, select the appropriate one as described previously and depress the *BIT DELETE* key while simultaneously depressing the *Program Control* key for the signal. This eliminates the signal from the memory of the sequencer.

≡ The ACS-2000 has other features that save time in the programming process. If there is a particular element you wish to activate through the entire cycle, such as a stage light or curtain, first push down and hold the selected *Program Control* key and then depress the *HOLD/SEL*ect key. The system changes to another channel and automatically continues to activate this signal until you return to this channel. You may use this feature for as many channels as desired. However, if you return to this channel to do more programming, you automatically clear any bits that are locked on. To eliminate all signals programmed in this manner, press *KEYBD CLEAR*. This eliminates all signals stored via *HOLD/SEL*ect.

- ≡ Depressing the *SET* key once exits the ACS-2000 from the sequencer programming mode.

The program you entered remains in memory even if you turn off the ACS-2000. The sequencer may be started by pressing the *SEQ*uence key until it illuminates. If the *SEQ*uencer button is on when you start a show, the sequencer is overridden by data from the audio source and the sequencer resumes when no data is being received.

RECORDING A PROGRAM ON TAPE

Before attempting to record a program on tape, you should first become thoroughly familiar with the procedures for live operation of the show and procedures for programming the sequencer (see *Live Operation* and *Sequencer* sections above).

Next, review the *Operations Manual* for the tape recorder included with your animation package (located in the *Appendix* of this manual). Become familiar with the section on how to record on the tape.

You learned in previous sections of this manual the ACS-2000 decodes information from the audio source into usable output signals that control the animation and other show elements. You also learned that the ACS-2000 encodes information into the sequencer or for live operation. In actuality, the ACS-2000 is simultaneously and constantly decoding and encoding information.

The remaining steps for programming onto tape use the *playback* and *record* modes of the tape recorder in conjunction with the *decode* and *encode* capabilities of the ACS-2000 to produce a tape containing the programmed data.

The diagram of the rear panel of the ACS-2000 is shown in Figure II-4 below.

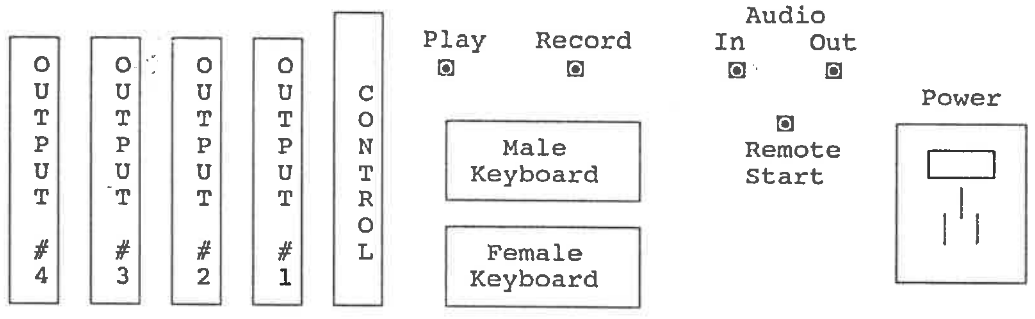


Figure II-4. ACS Rear Panel Layout

The ACS-2000 receives information from the audio source through the input connector labeled *play* on the ACS rear panel. A phono patch cable should be connected from this *input* to the audio source *output* for the channel (or track) holding the programmed data. Whenever the audio source is in playback mode the ACS receives and decodes any information coming from the source.

▪ MAKING AN ANIMATION DATA RECORDING

The ACS-2000 constantly outputs data through the connector labeled *record* on the rear panel of the ACS. If the ACS is processing information from a prerecorded tape, then the output is identical to the prerecorded tape. If the ACS is processing the information from the keyboard during live operation of the show, then the output is identical to the keyboard information. If the keyboard is used while playing a prerecorded tape, then the output contains both the information on the tape and the information on the keyboard.

By connecting the *record output* from the ACS to the *input* of a tape recorder, the information can be recorded onto an audio track whenever the tape recorder and track are placed in the record mode.

The first and most important step in programming and recording data is——

MAKE SURE YOU ARE RECORDING ONTO A BLANK TRACK OF TAPE

Whenever a tape recorder is recording new data, **all previously recorded information is erased.** Always double check the cable connections between the ACS and tape recorder to ensure you will get the intended results.

MULTI-TRACK TAPE RECORDERS

Most tape recorders used with the ACS-2000 have at least three separate tracks. That is, each tape track can be separately placed into either the record or playback mode. At least one of the tape tracks stores the audio portion of the tape (music, dialogue, etc.) and only one track stores control information even though two will be used for the recording.

Determine in advance which tracks you will use for audio and control information.

For purposes of this manual, we assume a 4-track recorder is being used. Tracks 1 and 2 are assigned for program audio and tracks 3 and 4 are used for the control information (data).

≡ The next step in making a control tape for animation is to record the audio (music, dialogue, etc.) portion of the show onto the desired tape track(s). Refer to the user's manual of your tape recorder if you need assistance.

≡ Make sure the audio tracks are in the *play* mode and rewind the tape to the beginning. Play the tape and adjust the audio system amplifiers and speakers to the desired levels. Rewind the tape.

≡ Inspect the connections on the tape recorder and verify that the *record* connector on the rear panel of the ACS is connected to the *input* connector of track 3 of the tape recorder. Also verify that the *play* connector of the ACS is not connected to the tape track on which you will be recording. This causes the ACS to decode the same information it is encoding and consequently will "lock up" the system.

≡ Select the channel you want to program in the manner described in the *Live Operation* section of this manual.

≡ Place track 3 of the tape recorder in the record mode and start the tape.

≡ Depress the *Program Control* keys corresponding to the *bits* of the desired movement or action. Change *channels* as desired to access other movements or control signals. Continue programming until you reach the end of the audio portion of the tape. All information keyed in via the keyboard is recorded onto the tape.

≡ Disengage the *record* function on track 3 and rewind the tape to the beginning. Verify that the *output* connector of track 3 is connected to the *play* connector on the rear panel of the ACS, and play back the information you have just recorded. If the show does not duplicate the movements you programmed, verify your cable connections and tape recorder settings.

Once you have made a pass through the system, you may want to add other movements to those you recorded. Because the ACS can simultaneously decode and encode, this can be accomplished by following the instructions below.

▪ ADDING MOVEMENTS

To add movements to the program, the *output* connector from track 3 of the tape recorder should be connected to the *play* connector at the back of the ACS-2000. In addition, the *record* connector on the back of the ACS should be connected to the *input* for track 4 of the tape recorder.

≡ Make sure that only track 4 is in the record mode and begin the tape.

≡ Depress the *Program Control* keys that correspond to the *bits* of the desired movement or action.

≡ Change channels as desired to access other movements or control signals.

≡ Continue programming until you reach the end of the audio portion of the tape.

≡ **Disengage the *Record* mode on the tape recorder** and rewind the tape.

The information on track 3 of the tape was decoded by the ACS, combined with the information added via the keyboard, and output onto track 4 of the tape recorder. This process is known as "ping ponging."

≡ Play back the data on track 4 by connecting the *output* of track 4 to the *play* connector of the ACS-2000

If you desire to add more information to the tape, repeat the procedure by playing back the information from track 4 and recording the newly combined information onto track 3, and so forth. However, there are two things to remember:

1. Always verify that the play back track contains good data before recording over a previous track.
2. Double-check your cables before recording.

▪ HOLDING/SELECTING A CHANNEL

The ACS-2000 has other features that save time in the programming process. If there is a particular control element you wish to activate through the entire cycle, such as a light, first push down and hold the selected *Program Control* keys and then depress the *HOLD/SELECT* key. The system changes to another channel and automatically continues to activate this signal until you return to this channel. You may use this feature for as many signals as desired. However, if you return to this channel to do more programming, you automatically clear any other locked on bits.

To eliminate all signals that are input using the *HOLD/SELECT* button, press the *KEYBD CLEAR*. This eliminates all signals stored via the *HOLD/SELECT.*

▪ DELETING MOVEMENTS

After you have programmed a number of passes through the cycle, it is likely that you may want to eliminate some of the signals. To eliminate a particular signal, select the appropriate channel as described previously and depress the *BIT DELETE* key while simultaneously depressing the *Program Control* key for the signal. This eliminates the signal from the tape.

If you desire to add more information to the tape, repeat the procedure by playing back the information from track 4 and recording the newly combined information onto track 3, and so forth. However, there are two things to remember.

1. **Always verify that the playback track contains good data before recording over a previous track.**
2. **Always double-check your cable connections before recording.**

Sally Industries, Inc.

ACS-50 Series

Animation Control System

Operating Manual

Rev 91-C

ACS-50 Series Operating Manual

DESCRIPTION OF ACS-50 SERIES

The ACS-50 Series is a specially designed animation control computer. It is both a playback and programming control unit. Depending upon your specific application, your ACS-50 may be configured at the factory to control up to 24 channels or circuits of animated movement, special effects, lighting, curtain motors, or any variety of devices needing to be synchronized with the animatronic production.

In addition, the ACS-50 can either automatically or manually control the operation of the audio equipment such as starting, stopping and rewinding a tape recorder.

The ACS-50 also features a motion sequencer, *AutoVox*--a voice-activated movement control, and a between-show timer. A self-contained 10-watt audio amplifier is included with most units.

Installing The System

ELECTRICAL POWER REQUIREMENTS

The ACS-50 decodes the audio signals from a tape recorder or other audio source. The decoded data is converted into control signals. To perform this task, it is imperative that the ACS has a power supply circuit free from voltage drops and surges caused by other equipment such as the air compressor. For best results, a designated electrical circuit should be used. In any case, the ACS should be on a circuit with minimal loading.

CONTROL OUTPUTS AND INPUTS

Because the ACS can control up to 24 movements or actions, it has 24 signal wiresand at least one common (B+) wire to operate the system. The rear panel of the ACS-50 has three *output* connections for controlling the show and audio equipment. Each of the connectors has fifty contact points. The *Appendix* shows which signal controls each specific movement or action.

The output connections and the signals they control are listed in Table II-1.

Output Number	Signal Control
Control	Tape Recorder Control, Miscellaneous
Output 1	Signals A1-A8, B1-B8, C1-C8
Output 2	Signals A1-A8, B1-B8, C1-C8-10

Table II-1. Output Connector Assignments

- In addition to the signal control contacts, there is a series of common (B+) contacts for the system wiring. A detail enlargement of each of the 50-pin connectors and the related outputs is shown in a schematic in the *Appendix.*. The diagram shows the exact location of each signal and common contact point. You will recall that the output power of the contacts is usually 24 volts dc.

  Output connectors are directly plugged into the character cables and provide the signal control to the valve boards. Because the two output connections are identical, either character can be connected to either connector. Figure II-1 shows the ACS-50 rear panel layout.

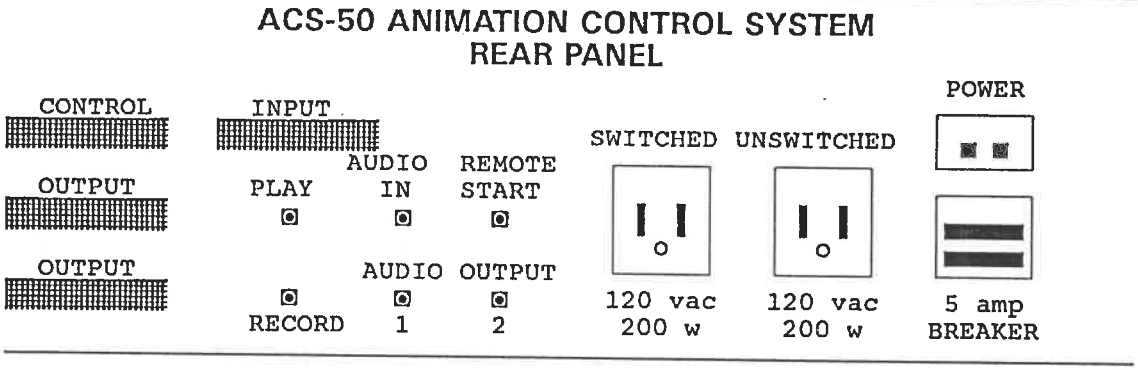


Figure II-1. Rear Panel of ACS-50

INPUT CONNECTOR

The *input* connector on the rear panel of the ACS-50 is for the optional *Remote Programming Console*. The *Remote Programming Console* is a device that enables live show operation from a remote location instead of from the console of the ACS.

PLAY AND RECORD CONNECTORS

Your ACS decodes control information from the data channel of the audio tape. The *input* connector labeled **PLAY** on the rear panel of the ACS-50 is where the ACS receives information. This line should be plugged into the tape recorder channel *output* containing the programmed data.

▪ PLAY

To play a previously recorded program, plug the *output* from the audio source data track into the *play* connector on the back of the ACS-50.

▪ RECORD

Your ACS-50 can record, or input, data onto tape. The output connector labeled *Record* on the rear of the ACS-50 is where the new information is sent to the tape recorder. A cable with a phono jack should be attached from this *output* to the tape recorder *input* to the audio tape track that is to contain the data. When the tape recorder is put into record mode, the data from the ACS is recorded onto the tape.

AUDIO CONNECTORS

The audio connectors are used in conjunction with the ACS *AutoVox* feature. *AutoVox* allows your character's mouth to move in synchronization with the audio spoken into a microphone during live operation.

- The *audio input* connector on the back of the ACS-50 supplies the audio signal to the *AutoVox* circuit. It may be fed directly from the tape output or from the speaker output of the amplifier (with less than 10 watts into 8 ohms). You may find one works better than the other.

▪ DUAL FUNCTION

There are two *audio outputs* for use in conjunction with the *AutoVox*. This permits the *AutoVox* circuit to be used for two characters. One of the outputs should be connected to each character's speaker connection. On the ACS-50 front panel is a button labeled *DUAL FUNC* which, when depressed, switches the audio from output 1 to output 2.

REMOTE START

The remote start input connector (optional) starts the system manually from a distant location. Functionally, the input is the same as the start button on the front panel of the ACS (see discussion on tape control).

ELECTRICAL OUTPUT - UNSWITCHED

The rear panel has a standard female electrical receptacle that can supply power to your tape recorder or other device. This device is operational any time the ACS-50 is plugged in, whether on or off.

ELECTRICAL OUTPUT-SWITCHED

The rear panel also has a standard female electrical receptacle that is only activated when the ACS-50 is operating.

THE ACS-50 KEYBOARD

On the left side of the front panel are three rows of seven buttons referred to as *Program Control* keys. These buttons activate each of the show signals and perform other functions which are discussed later.

On the right side of the panel are three rows of buttons that determine the ACS mode. The buttons function to allow recording, sequencing, automatic mouth control (*AutoVox*), etc.

The two groupings of switches constitute the ACS-50 keyboard as depicted in Figure II-2.

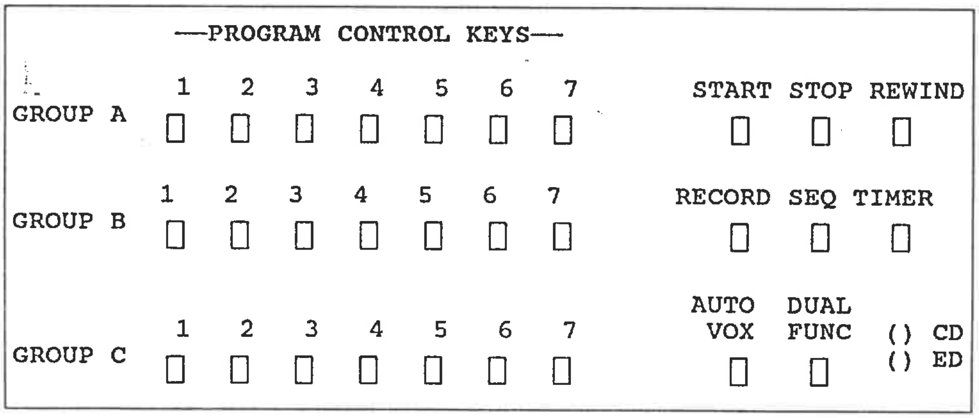


Figure II-2. ACS-50 Keyboard

PLAYBACK OF A PRERECORDED TAPE

The primary function of the *Animation Control System* (ACS) is to decode information from the tape and convert the information into usable outputs. Now that you have installed and verified all of the cable connections to your ACS, you can use the system to play back a prerecorded tape.

To play back a prerecorded tape, turn on the ACS power with the switch on the upper right side of the rear panel. Examine the various buttons on the front panel. A diagram of the front panel is shown Figure II-2.

▪ PROCEDURE FOR PLAY BACK

▸ Make sure all of these buttons are OFF, i.e. not lighted.

▸ Place the prerecorded tape in the tape recorder and start the tape recorder. If the ACS-50 has been connected properly, the *CARRIER DETECT* (CD) light will illuminate. This light will illuminate whenever the ACS is receiving information in proper format for decoding from the tape recorder.

▸ If the *ERROR DETECT* (ED) light illuminates, it means the information being received by the ACS is unintelligible and cannot be decoded properly. Check the cable connections on the rear of the ACS and verify that the tape has valid information.

TAPE RECORDER CONTROL

The ACS controls the tape deck during normal system operation. The following is a description of the switches in the manual control section.

STOP will stop the tape deck and the show.
START will start the tape deck and the show.
REWIND will stop the show and put the tape deck in rewind.

TIMER

The *TIMER* sets the length of time from the end of a show to the beginning of the next show. The *TIMER* is activated whenever the button is depressed and the LED indicator on the button is lit. The *TIMER* will begin its countdown when the tape recorder is put into rewind or stopped, and will put the tape into PLAY when the countdown is complete. When programming the *TIMER*, be sure to program enough time to allow the tape to complete its rewind. Otherwise, the tape will begin playing before it rewinds completely.

▪ PROGRAMMING THE TIMER

Depress the *TIMER* button until it latches and the LED on the button illuminates. Then depress the *RECORD* button until it latches and the LED on the button activates.

Whenever the *TIMER* and *RECORD* buttons are both activated at the same time, the *Program Control* keys for GROUP A are activated for setting time. Each *Program Control* key corresponds to a period of time as shown in Table II-2.

TABLE II-2. ACS-50 PROGRAM KEY TIMER ASSIGNMENTS

CONTROL KEY	TIME
#1	30 seconds
#2	1 minute
#3	2 minutes
#4	4 minutes
#5	8 minutes
#6	15 minutes
#7	30 minutes

▪ SETTING THE TIMER

To set the time between shows, depress the *Program Control* keys that when added together, equal the amount of desired time between shows. Release the *RECORD* button. The amount of time entered is now set and saved in the ACS.

Example: To set the timer for 8.5 minutes, simultaneously depress and continue to hold GROUP A *Program Control* Keys #1 (30 seconds) and #5 (8 minutes), and release the *RECORD* button.

▪ ERASING THE TIMER

To erase or reset the *TIMER*, depress the *REWIND* while the *RECORD* and *TIMER* buttons are depressed.

AutoVox tm

This feature automates the character's mouth in synchronization with an input voice signal. It is used primarily with live show operation, but can also be used while playing a prerecorded tape. When used with a prerecorded tape, it overrides any programmed mouth movement on the tape. The output of the *AutoVox* is fed only to the character and can not be recorded onto tape during new show programming.

▪ PLAYBACK

Depressing the *AutoVox* button automatically activates the *AutoVox* feature in the playback mode. The button latches on and the LED indicator remains illuminated. The *AutoVox* overrides any programmed mouth control on the tape.

▪ LIVE OPERATION

Put a **BLANK** tape into the tape recorder, and depress *PLAY* and *RECORD* buttons on the recorder.

Connect a microphone to the microphone jack on the front of your tape recorder for the appropriate channel of audio that corresponds to the audio input on the rear panel of the ACS-50.

Depress the *AutoVox* button on the front of the ACS-50. Your character's mouth will operate in synchronization with the input voice. You must speak clearly and distinctly. You may need to adjust the record level on the tape deck if the audio from the character is too loud or soft.

▪ DUAL FUNCTION

The *AutoVox* can operate two characters with the *DUAL FUNCTION* button. This button switches the *AutoVox* output from one character to the other. It is useful when operating two characters live.

SEQUENCER

The *SEQUENCER* is a built-in ACS-50 memory feature that causes characters in your show to continue to move in a life-like manner whenever the ACS is not receiving data from the tape recorder. It prevents the characters from going "dead" while the tape recorder is rewinding or stopped.

The *SEQUENCER* memory capability allows activation of any of the control outputs of the ACS for a period of thirty seconds. At the end of this period, the *SEQUENCER* will simply repeat the programmed sequence until it is turned off or the ACS receives data from the tape recorder.

To activate the *SEQUENCER*, depress the *SEQ* button on the front panel of the ACS. The button latches on and the LED will illuminate. When the ACS receives data from the tape recorder, the received signal will override the programmed information on the *SEQUENCER*.

To program the movements of the *SEQUENCER*, see the *Programming The Sequencer* section of this manual.

To restore the sequencer into memory after a power failure, see the *Saving Sequencer Information* section of this manual.

LIVE SHOW OPERATION

In addition to decoding information from the tape recorder to control your show, the ACS encodes information, thus allowing you to operate your show manually. Furthermore, this is helpful in troubleshooting any problem that may arise.

▪ GRID SHEET

Before you can operate the character or show, the movements (or other elements) must be identified in a manner that the ACS can understand. Consequently, a grid system is used to label each control element. Think of this grid as an unique address for each movement or control channel.

The 24 maximum outputs comprise a grid of three *CHANNELS* of eight *BITS* each. Each movement or action in your show is assigned a two-part address code consisting of one channel and one bit. In this manner, each movement is assigned a two bit address that can be understood by the ACS-50. See Table II-3.

		BITS							
		1	2	3	4	5	6	7	8
CHANNELS	A	HEAD NOD							
	B			EYE TURN					
	C						ARM OUT		

Table-3. Sample ACS-50 Grid Map

- **In the above example, the *Grid Sheet* indicates that the address for the character's head turn movement is Channel *A*, Bit *1*. Also on this matrix you will note that *B3* represents the eye turn movement and *C6* is the address for the character's arm-out motion.**

In the *Appendix* your specific show movements are outlined in grid form.

▪ MANUAL CONTROL OF MOVEMENTS

When operating or programming the show, you first must identify the *channel* and *bit* for the desired movements.

On the lower front panel of the ACS-50 are three groups of seven buttons referred to as the *Program Control* keys (see Figure II-3). These buttons correspond to the first seven of the eight bits of the matrix. By depressing these buttons, you will activate Bit 1-7 for each of the three groups of Channels.

—PROGRAM CONTROL KEYS—

	1	2	3	4	5	6	7	START	STOP	REWIND
GROUP A	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6	7	RECORD	SEQ	TIMER
GROUP B	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6	7	AUTO VOX	DUAL FUNC	() CD () ED
GROUP C	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Figure II-3. ACS-50 Keyboard

Certain animated show functions always use the same channel and bit configuration. That is, tape recorder *STOP* is always *A-8*, *DUAL FUNCTION* is always *B-8*, and tape recorder *REWIND* is always *C-8*. Since the ACS 50 has separately designated buttons for these functions, the panel only contains seven *Program Control* keys.

PROGRAMMING THE SEQUENCER

The ACS has a built in *SEQUENCER*, allowing 30 seconds of programming for all three channels. It will repeat the pre-set sequence until the taped recorder is started either manually or by the timer or when the sequencer button is released. This feature gives the characters a life-like appearance between shows.

▪ PROGRAMMING STEPS

- ▸ Make sure the *TIMER* button is NOT depressed.
- ▸ Depress the *SEQ* button. The LED will illuminate.
- ▸ Depress the *RECORD* button to put the ACS into the record mode.

You are now ready to program. Depress the *Program Control Keys* in the order you want the character to move. The keys can be activated individually or at the same time in any order.

- You may continue to program additional information into the program indefinitely. None of the information programmed into the SEQUENCER is erased, even if you continue beyond the 30- second repeat cycle. Thus, you can add more control information on each pass of the cycle.

To erase the sequencer memory, depress the **STOP** button while the ACS is in the sequencer programming mode. This will clear ALL information in the sequencer.

The sequencer program can be added to at any time by placing the ACS into the programming mode as set forth above.

The program placed in the sequencer will remain in ACS memory until the memory is cleared or ACS power is lost or turned off.

▪ SAVING SEQUENCER INFORMATION

The information in the SEQUENCER is in the ACS memory and will remain there unless power is turned off or electrical power is lost. When this happens, the information in the sequencer must be reprogrammed unless you have saved the information onto tape.

To save the information in the sequencer, place the ACS into the proper mode by depressing the *SEQ* button and the *RECORD* button as outlined in *Programming the Sequencer* above.

Insert a tape (not a prerecorded master tape because it will be erased) into the tape recorder and place the recorder into *record*.

Release the *SEQ* button on the ACS-50. The information in the sequencer will be recorded onto the tape in less than one second.

To retrieve the information from the tape after a power failure or shutdown, place the ACS-50 into the playback mode (all buttons off) and play the tape containing the sequencer information. The information will be automatically loaded into the ACS memory. **CAUTION!!** Any information previously in the memory of the SEQUENCER will be erased.

RECORDING A PROGRAM ON TAPE

Before attempting to record a program on tape, become thoroughly familiar with procedures for live show operation and procedures for programming the sequencer. Second, review the tape recorder operations manual included with your animation package (located in the *Appendix* of this manual). In particular, become familiar with the section on how to record information on the tape.

You learned in previous sections of this manual that the ACS-50 can *decode* information from the tape recorder into usable output signals that control the animation and other elements of the show. You also learned that the ACS has the ability to *encode* information into the SEQUENCER, or for live operation.

The remaining element for programming onto tape is to utilize the *PLAYBACK* and *RECORD* modes of your tape recorder in conjunction with the decode and encode capabilities of the ACS-50, to produce a tape with programmed information.

Let's review the rear panel of the ACS in Figure II-4

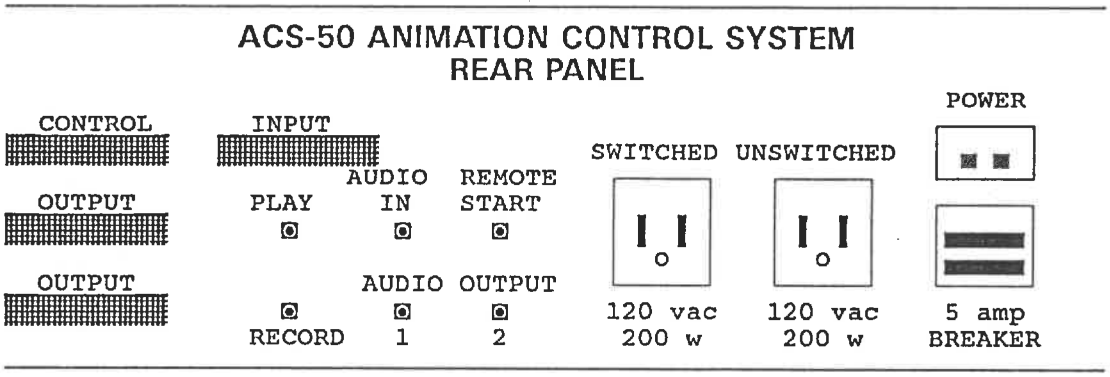


Figure II-4. Rear Panel of ACS-50

The ACS receives information from the tape recorder through the input connector labeled *PLAY* on the rear panel of the ACS-50. A phono patch cable should be attached from this *input* to the *output* of the tape recorder for the track containing the programmed data. Whenever the tape recorder is in the *playback* mode the ACS will receive and decode any information on the tape.

The ACS-50 sends information through the connector labeled *RECORD* on the rear panel of the ACS whenever the *RECORD* button on the front panel is activated. The output contains information being processed by the ACS from the keyboard.

By connecting the *output* from the ACS into the *input* of the tape recorder, the information can be recorded whenever the tape recorder is in the record mode.

A phono patch cable should be attached from *RECORD* connector of the ACS-50 to he INPUT of the tape recorder for the tape track that is to contain the coded data. When the tape recorder is put into *RECORD* mode, data output from the ACS-50 will be recorded onto the tape.

The first and most important step in programming and recording data onto tape is

MAKE SURE YOU ARE RECORDING ONTO A BLANK TRACK OF TAPE

Whenever a tape recorder is recording new information, any previously recorded information is erased. Always double check the cable connections from the ACS to the tape recorder to ensure that you will obtain the intended result.

MULTI-TRACK TAPE RECORDERS

Most tape recorders used with the ACS have at least three separately controlled tracks of tape. That is, each track of tape can be individually placed in either the record or playback mode. At least one of the tape tracks will be used for the audio portion of the tape(music, dialogue, etc.) and at least two of the tracks will be used for control information. Determine in advance which tracks you will use for audio and control information. For purposes of this manual, we will assume a four track recorder where tracks one and two are used for audio and tracks three and four are used for the control information.

The next step to making an animation control tape is to record the audio (music, dialogue, etc.) portion of the show onto the desired tape track. Refer to your tape recorder user's manual if you need assistance.

Make sure the audio tracks are in the PLAY mode and rewind the tape completely. Play the tape and adjust the audio system amplifiers and speakers to the desired levels. Rewind to the beginning of the tape.

▪ RECORDING A PROGRAM ON TAPE

Inspect the tape recorder connections and verify that the *RECORD* connector on the rear panel of the ACS-50 is attached to the *input* connector of *track 3* of the tape recorder.

Place *track 3* of the tape recorder in the record mode and start the tape.

Depress the *Program Control* keys that correspond to the bits of the desired movement or action. Continue programming until you reach the end of the audio portion of the tape. All information keyed in via the keyboard has been recorded onto the tape.

Disengaged the record function on track 3 and rewind the tape to the beginning. Verify that the *OUTPUT* connector of *track 3* is connected to the PLAY connector on the rear panel of the ACS, and play back the recorded information you have just entered. If the show does not duplicate the movements you programmed, verify your cable connections and tape recorder settings.

▪ ADDING MOVEMENTS

Once you have made a pass through the system, it is probable that you would like to add other movements to those you recorded. Because the ACS can simultaneously decode and encode, this can be accomplished by playing back the data recorded on track 3, adding new data via the keyboard, and recording the combined data on track 4.

The first step is to put the ACS into the *EDIT*. To place the ACS-50 in the *EDIT*, turn off the ACS power for a few seconds. Depress and hold the *RECORD* button while turning on the ACS power. This procedure tells the ACS you want it to decode information from tape while programming additional information from the keyboard, and output the combined information.

Check the connections on the rear panel and verify that the *OUTPUT* connector from *track 3* of the tape recorder is connected to the *PLAY* connector on the ACS-50. In addition, the *RECORD* connector on the back of the ACS should be connected to the *INPUT* connection for track 4 of the tape recorder.

Make sure that only track 4 is in the record mode and start the tape. Depress the *Program Control* keys corresponding to the bits of the desired movement or action. Continue programming until you reach the end of the audio.

Disengage *Record* mode on the tape recorder and rewind the tape.

The information on track 3 of the tape, combined with the information added via the keyboard was decoded by the ACS-50, and output onto track 4 of the tape recorder. Play back the data on track 4 by connecting the *output* of track 4 to the ACS *PLAY* connector.

INSTALLING THE SYSTEM

EQUIPMENT LOCATION

The location to the animated characters and associated control equipment to run your animatronic system are an important factors in achieving reliability and serviceability. If you have doubts about the location selected to house the characters or equipment, you should contact the Sally *Customer Service Department.*

⌘ CHARACTERS

Animated characters should be kept out of direct sunlight and in generally dry environments.

Ultraviolet light may cause skin and costume fading as well as general material deterioration.

Moisture can also be damaging by creating mold and mildew, rust and corrosion.

Generally, characters should be anchored to the floor, stage or some other structure to stabilize the figure and provide a better performance.

⌘ ELECTRONIC EQUIPMENT

The electronic equipment, e.g., ACS, audio source, amplifiers, etc. should also be kept out of direct sunlight and away from moisture and dampness.

Furthermore, such electronic equipment should be kept in relatively dust-free areas to avoid damage to switches, controls, relays, tape recorder playback and record heads, etc.

Cable lengths should generally not exceed 100-feet; the shorter, the better. Control and audio cables should be routed away from noise-producing sources such as motors, solenoids and high voltage switching circuits.

⌘ AIR COMPRESSOR/DRYER

Air source equipment should also be kept in a relatively dry and dust-free area in order to reduce the amount of moisture produced during the compressor cycle and to avoid clogging delicate air valves with foreign matter.

Air lines should be tightly secured at their connectors and run on the most direct and shortest route. It is permissible for the air compressor equipment to be placed in a soundproof housing or away from the other equipment to reduce mechanical noise. However, air compressors need a well-ventilated area in which to function.

ELECTRIC POWER CONSIDERATIONS

Whenever possible the ACS and audio equipment should be isolated from electrical circuits which may have motor-driven equipment or electrical heavy surges. In other words, the ACS and audio equipment generally can share the same circuit, however, the air compressor should operate from a separate electrical circuit to reduce any possibility of interference by the electric surges created when the compressor motor is cycled on. It's also advisable that heavy stage lighting be delegated to a separate circuit.

CONTROL OUTPUTS

Because the ACS-2000 can control up to 128 channels, it therefore must have at least 128 signal wires and one common (B+) wire to operate the system. The rear panel of the ACS contains up to five output control connections, each connection containing 50 contact points. The *Appendix* of this manual shows which signal controls each specific movement or effect in your show. The output connections and the signals they control are listed in Table III-1 and the ACS-2000 back panel is depicted in Figure III-1

OUTPUT NUMBER	SIGNAL CONTROL
CONTROL	TAPE RECORDER CONTROL, MISC.
OUTPUT NUMBER 1	SIGNALS A1-A8, B1-B8, C1-C8, D1-D8
OUTPUT NUMBER 2	SIGNALS E1-E8, F1-F8, G1-G8, H1-H8
OUTPUT NUMBER 3	SIGNALS I1-I8, J1-J8, K1-K8, L1-L8
OUTPUT NUMBER 4	SIGNALS M1-M8, N1-N8, O1-O8, P1-P8

TABLE III-1. ACS-2000 Output Connector Assignments

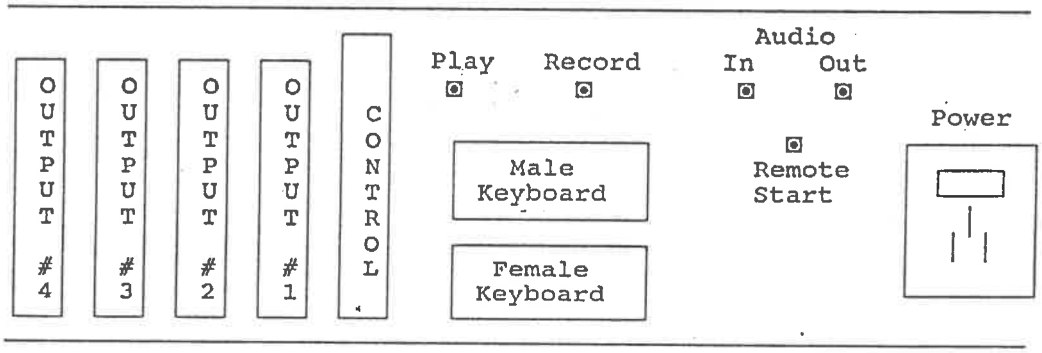


Figure III-1. ACS Rear Panel Layout

INSTALLING THE SYSTEM

Generally, the outputs from the ACS are connected directly to the characters or other controlled elements of the show. Your show equipment package includes cables designed to match these ACS connectors and provide control signals (and B+ - 24 vdc) to the show. Extension cables may be acquired through Sally, and probably locally, in the event more distance is needed between the ACS and show elements.

When the number of locations exceeds the four output connections (usually eight characters and four output connections), an interface panel is required. If your show has an interface panel, details will be provided in the *Appendix*.

PLAY AND RECORD CONNECTORS

Your ACS decodes the information on the data channel of the audio tape. The input jack labeled *play* on the rear panel of the ACS is where the information is received by the ACS. This line should be plugged into the output of the audio source channel containing the programmed data.

To play a previously recorded program, the output from the data track on the tape deck should be plugged into the play connector on the back of the ACS.

- Your ACS also has the capability to record, or input data onto tape.

WARNING: Do Not Record Onto Your Prerecorded Show Tape.

The output jack labeled *record* on the rear of the ACS, is where the new information is output to the tape recorder. A phono jack cable should be attached from this output to the input of the tape recorder for the track of tape that is to contain the coded data. When the tape recorder is put into the record mode, then the data input from the ACS will be recorded onto the tape.

■ OTHER AUDIO CONNECTORS

The audio connectors are used in conjunction with the *AutoVox* feature of the ACS. The *AutoVox* feature causes the mouth of your character to move in synchronization with the audio during live operation.

Audio Input

The *audio input* connector on the back of the ACS supplies signal to the *AutoVox* circuit. It may be fed directly from the tape output or from the speaker output of the amplifier. One may work better than the other.

Audio Output

The *audio output* connector on the ACS back panel should be connected to the *input* of the audio amplifier which, in turn, is connected to the speakers. This connection only is used when the *AutoVox* feature is required, otherwise the audio source is connected directly to the amplifier.

Remote Start

The *remote start* input connector is for starting the system manually from a distant location. Functionally, the input is the same as the start button on the front panel of the ACS (see discussion on *tape control*). This connection can be used for any remote start mechanism including motion detectors, push buttons, etc.

Electrical Output-Switched

The rear panel also contains a standard female electrical receptacle that is only activated by the ACS. This output is rated at 120 v @ 200 watt or its non-U.S. equivalent.

Section IV
Maintenance

Air System Maintenance

COMPRESSOR AND AIR TANK

Compressed air is the main source of power for your characters and show performance equipment. If moisture is allowed into the air system, it will damage the pneumatic components.

Air compression causes water to build up in the compressor tank. If water is allowed to accumulate it may create rust and corrosion which clogs air lines, filters and the delicate valves.

In addition to damaging the pneumatic system, water in the compressor tank reduces the tank's storage capacity. This causes the compressor to run excessively and can cause motor damage.

The compressor tank should be drained of water at least weekly. If you are located in a humid area, draining should take place more frequently. See your compressor manual included in the *Appendix* to locate the release valve at the bottom of the tank. Opening this valve allows water to drain.

AIR FILTERS

The air filters should be inspected regularly and replaced when contaminated. Contamination will show up as a brown or yellow staining of the filter element.

WARNING

Even though the air compressor may be turned off, the air storage tank remains under pressure even though the compressor itself is off. Removal of components may result in serious injury. DO NOT attempt to work on compressor with open cuts or abrasions on hands or forearms. This could result in air injection under the skin. Also, use a pan or other container so that discharged water does not come into contact with the floor or any electrical connections.

Audio System Maintenance

THE TAPE MACHINE

The tape contains all the information for operation of your show. If the tape machine is not functioning properly, your show can not and will not function properly. At best, the audio quality will suffer, and at worst, the Animation Control System will be unable to decode the control information on the tape, disabling the show entirely.

The primary cause of field problems is failure to clean the tape recorder. If you fail to clean the tape recorder on a regular basis, the show performance will slowly and progressively deteriorate.

▪ CLEANING THE HEADS AND TAPE GUIDES

The tape recorder heads should be cleaned daily, and twice daily during heavy operation or during dry, dusty weather conditions.

Spray head cleaner on cotton swabs or directly onto the heads and tape guides, and thoroughly wipe off all dirt and oxide buildup.

▪ CLEANING THE PINCH ROLLER

On a cassette tape recorder remove the cassette door cover and close the cassette door. Hold down the play button so the tape deck remains in the play mode. Spray head cleaner on a cotton swab or directly onto the pinch roller and lightly press the swab onto the pinch roller to the right side of the capstan shaft. This will prevent the swab from becoming entangled. Clean until there is no visible residue on the pinch roller.

▪ CLEANING THE CAPSTAN SHAFT

Activate the pause mode on the recorder and spray head cleaner on a cotton swab; lightly press the swab onto the rotating capstan shaft. Clean until there is no visible residue on the capstan shaft.

CARE AND MAINTENANCE OF
DANIEL AND THE DIXIE DIGGERS
FOR CELEBRATION STATION

Regular cleaning and maintenance of your characters is essential to keep your show looking new and characters running smoothly.

Cleaning Daniel and the Dixie Diggers

All characters should be dusted regularly, i.e. weekly, monthly, etc.

To dust characters use a feather duster or blow off characters with an air hose set at 50 or 60 psi of air pressure. Remember to brush fur with a hair brush back to original condition.

Mask: Wash characters with a mild solution of soap and water. (We suggest Ivory dishwashing liquid because it is very mild.) Using a sponge or soft cloth that has been dipped in the soapy water, gently wash the soiled area. **DO NOT SCRUB.** This may lift the paint. Pat dry with a soft dry cloth. DO NOT submerge mask or use excessive amount of water. Remember to cover the character's costume, or remove it before washing mask to protect it. If you notice worn spots in the mask, these can usually be repaired with touch-up paint if the damage is not very extensive.

Fur:

Try using a damp sponge to clean the fur.

If fur is very dirty or stained, it can be cleaned with foaming carpet cleaner. Dust off characters first, then follow the manufacturers instructions. Don't forget to protect your hands with latex gloves. Instead of vacuuming, use a damp sponge to remove cleaner and dry with a soft cloth. DO NOT use excessive amounts of water.

Remember to avoid continuous exposure to direct sunlight, this may fade the fur and costume.

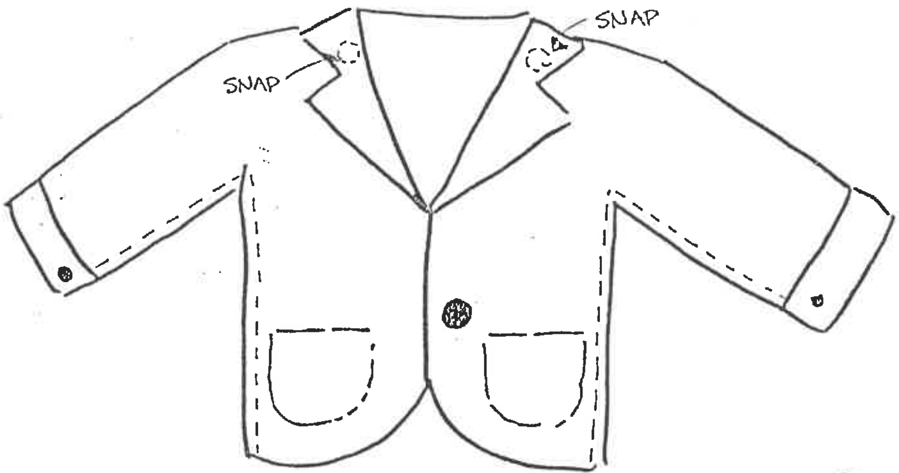
Costume

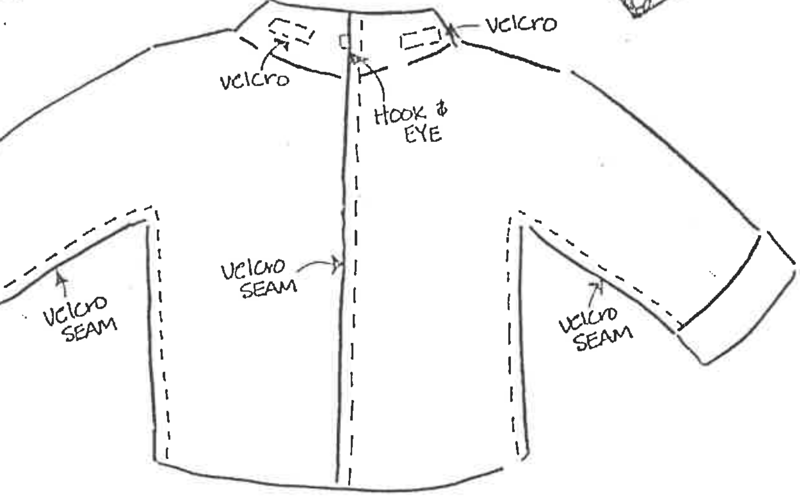
Regular dusting and maintenance of your characters is the easiest way to keep them clean and looking great.

To clean stains and spots on the characters' costumes, use spot remover on soiled areas.

Characters costumes can be dry cleaned if they become very dirty. To remove costumes, open Velcro at the back and under the arms. Unsnap the jacket at the collar.

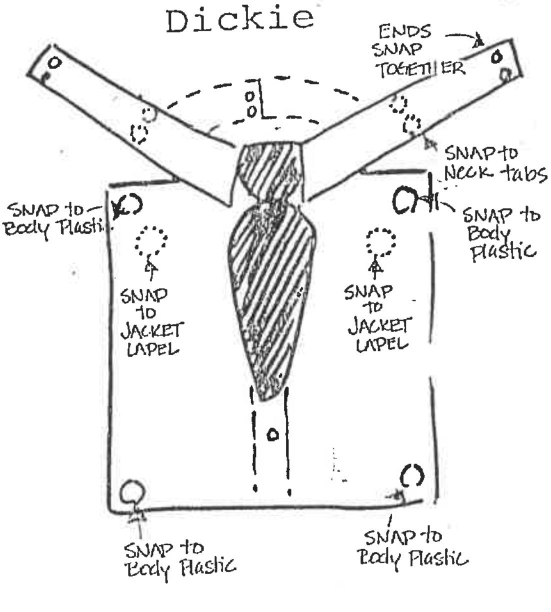
Costume



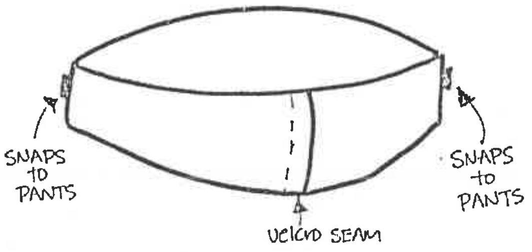


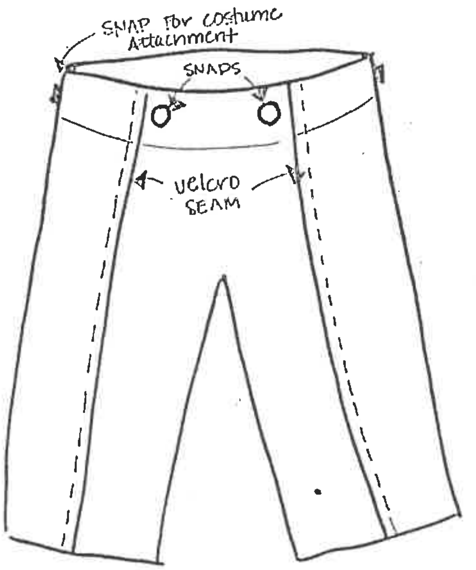
Jacket

Dickie



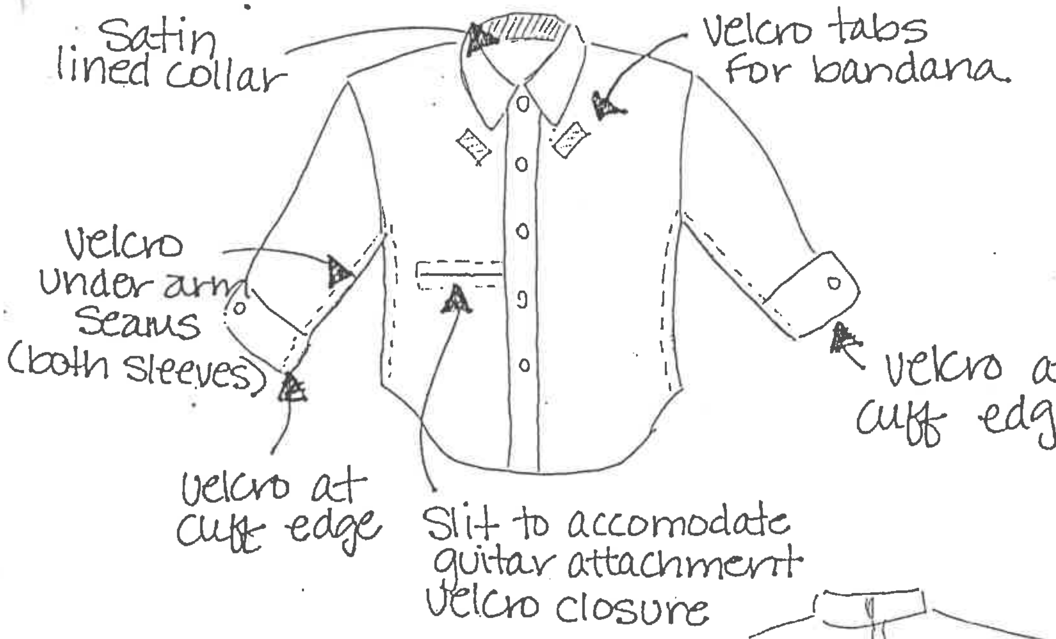
Cummerbund or Sash

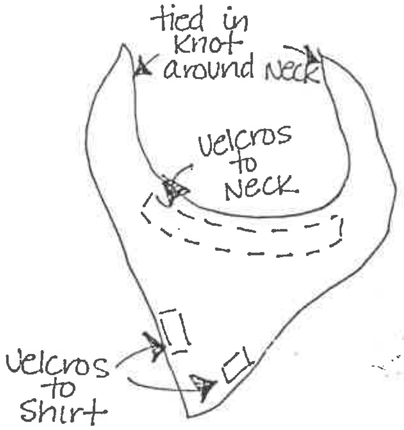


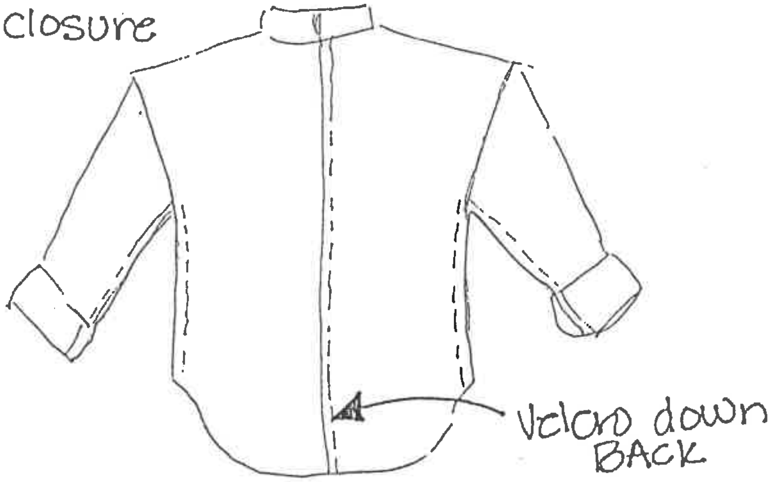


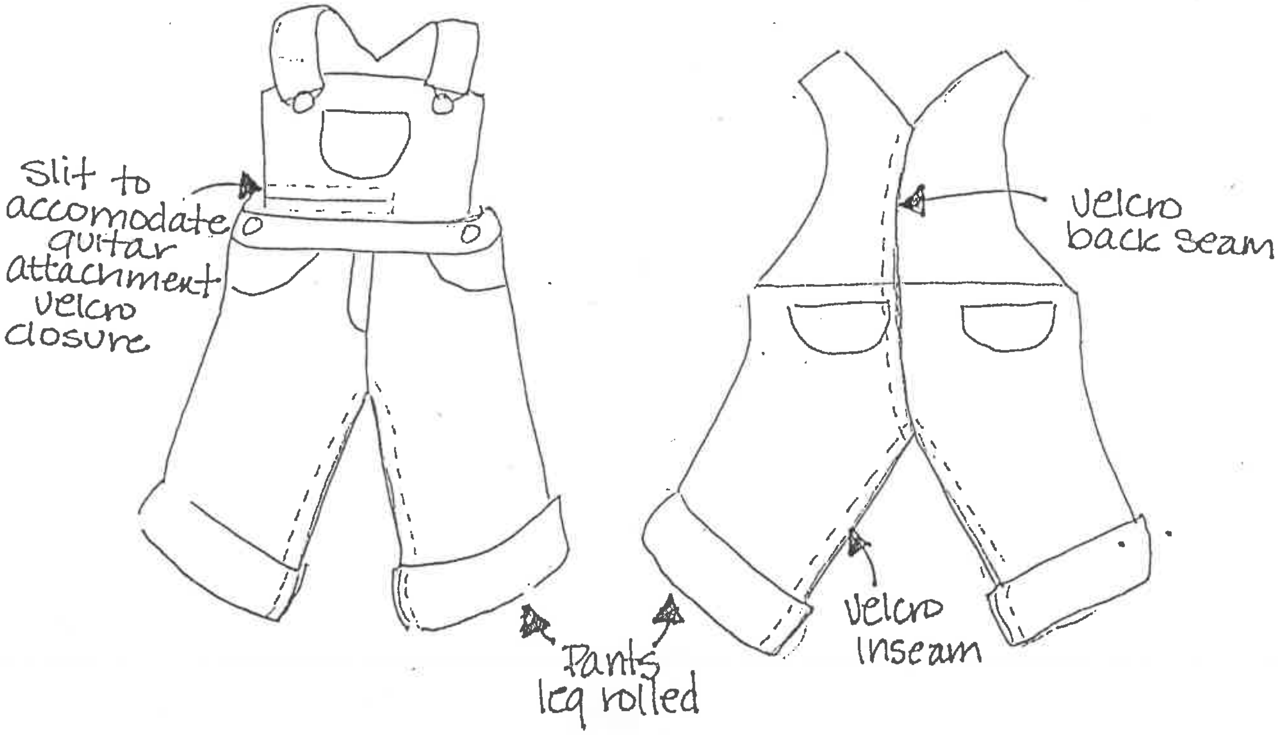
Pants

Costume


Satin lined collar
velcro tabs for bandana
velcro under arm seams (both sleeves)
velcro at cuff edge
velcro at cuff edge
Slit to accomodate guitar attachment velcro closure


tied in knot around Neck
velcros to Neck
velcros to shirt


velcro down BACK


Slit to accomodate guitar attachment velcro closure
velcro back seam
Pants leg rolled
velcro inseam

REPAIRING TEARS IN THE SILICONE

1. Clean the surface to be repaired with alcohol, or a weak solution of *Top Job* (1/4 cup of cleaner per gallon of water) and dry thoroughly.
2. Using a t-pin, place a small amount of silicone on the inside of the tear (wipe excess off outer surface).
3. Close the tear with small straight pins; again wipe excess off outer surface.
4. Allow 15-20 minutes for silicone to cure. Do not move character or touch curing silicone. If the tear is still visible, follow steps #1-4 again.
5. On a clean, lint-free surface, mix a small amount of powder pigment (about the size of a pea) with silicone (about the size of a silver dollar). Mix well with craft sticks. Be careful; silicone will become stiff and lumpy if stirred for too long. If this happens, do not use ... mix up a new batch.
6. Spread silicone over tear in a thin layer. Be sure to cover the entire damaged area.
7. Dip a finger in alcohol and smooth the surface. Rub the edges in to the existing skin for a smooth transition and to help disguise the repair.
8. Dip a make-up sponge in alcohol (saturate it well) and then pat on the fresh silicone layer. The sponge ill give the repair a textured surface that more closely resembles skin. Do not press too firmly with the sponge as this will pull up the silicone layer. Don't be afraid to use too much alcohol.
9. Now apply loose face powder. Dip a brush into the powder. Hold the brush 3-4 inches from the repaired area and blow powder on to the repaired surface. Powder will go everywhere, but can be easily removed with alcohol, once the repair has completely cured.
10. Leave the repair alone. It is crucial that the character does not move and that nothing touches or rubs the area for the next 10-12 hours (depending on how bad the area was damaged). Repairs to the face and neck should cure for 12 hours. Repairs to the hand, if not severe, should cure for 8-10 hours.

If you have any questions or problems, please call (904) 353-5051, Monday - Friday, 8:00 a.m. - 5:00 p.m. (EST) and ask for Kathy Seil, Art Department. After business hours or on weekends & holidays, call (904) 443-6900 and leave a message (including your name, a number where you can be reached, and a description of your problem).

CARE AND MAINTENANCE OF JETHRO FOR CELEBRATION STATION

Regular cleaning and maintenance of your characters is essential to keep your show looking new and characters running smoothly.

Cleaning JETHRO:

Jethro should be dusted regularly, i.e. weekly, monthly, etc.

To dust Jethro use a feather duster or blow off characters with an air hose set at 50 or 60 psi of air pressure. Remember to brush fur with a hair brush back to original condition.

Mask and Hands : Wash characters with a mild solution of cleaner and water. (We suggest Top Job) Using a sponge or soft cloth that has been dipped in the soapy water, gently wash the soiled area. **DO NOT SCRUB.** This may lift the paint. Pat dry with a soft dry cloth. DO NOT submerge mask or use excessive amount of water. Remember to cover the character's costume, or remove it before washing mask to protect it. If you notice worn spots in the mask, these can usually be repaired with touch-up paint if the damage is not very extensive.

Costume

Regular dusting and maintenance of Jethro is the easiest way to keep him clean and looking great.

To clean stains and spots on Jethro's costume, use spot remover on soiled areas.

Jethro's costumes can be dry cleaned if it becomes very dirty. The costume is easily removed due to the velcro seams. Overalls open at the back and the inseam. Shirt opens at the back and under both arms.

SALLY INDUSTRIES, INC.

Animation Control System Grid Sheet

PROJECT CELEBRATION STATION

128k Memory

DATE DECEMBER 18, 1991

NAME 1 Daniel

NAME 2 Col. Beau

NAME 3 Scratchmo

NAME 4 Jethro

NAME 5

NAME 6

NAME 7

NAME 8

NAME 9

CARD	1	2	3	4	5	6	7	8
A	4 Eyes Left	4 Eyes Right	4 Eyes Blink	4 Eyes Brows Up	4 Head Turn Left	4 Head Turn Right	4 Head Nod	STOP
B	4 Head Tilt Right	4 Left Elbow Down	4 Left Arm Fret	4 Right Foot Tap	4 Mouth	4 Right Elbow Up	4 Right Wrist Down	MIBx/ B–Day Sign
C	4 Right Arm Out	Lgt#1 Pig Spot	Lgt#2 Whit Wash	Lgt#3 Red Wash	Lgt#4 Blue Wash	House Control	Pig Curtain	Rewind
D	Lgt#1 Beau Spot	Lgt#2 Scratch Spot	Lgt#3 Daniel Spot	Lgt#4 White Wash	Lgt#5 Red Wash	Lgt#6 Blue Wash	Dog Curtain	Dog Set Lights
E	1 Eyes Left	1 Eyes Right	1 Eyes Blink	1 Head Tilt Left	1 Head Tilt Right	1 Head Nod		
F	1 Head Left	1 Head Right		1 Left Arm Out	1 Mouth	1 Left Elbow Up	1 Left Wrist Up	
G	1 Right Elbow Up	1 Right Arm Out	1 Left Rib	1 Right Rib	1 Waist Left			
H								
I	2 Eyes Left	2 Eyes Right	2 Hat Up	2 Head Tilt Left	2 Head Titl Right	2 Head Nod	2 Head Left	2 Head Right
J	2 Left Arm Fret	2 Left Elbow Down	2 Right Arm Out	2 Right Elbow/ Wrist	2 Mouth	2 Left Rib	2 Right Rib	2 Sway Right
K	2 Left Foot Tap							
L								
M	3 Eyes Left	3 Eyes Right	3 Eyes Blink	3 Head Tilt Left	3 Head Tilt Right	3 Head Nod	3 Head Left	3 Head Right
N	3 Left Shoulder Up	3 Left Arm Out	3 Left Elbow Up	3 Left Wrist Out	3 Mouth	3 Right Shldr. Up	3 Left Rib	3 Right Rib
O	3 Sway Right	3 Left Foot Tap	3 Right Arm Out					
P								

SALLY INDUSTRIES, INC.

Animation Control System Grid Sheet

24K Memory

Project CELEBRATION STATION

Character 1 JETHRO

Character 2

Character 3

DATE DECEMBER 18, 1991

CARD	1	2	3	4	5	6	7	8
A	EYES LEFT	EYES RIGHT	EYES BLINK	EYE BROWS UP	HEAD TURN LEFT	HEAD TURN RIGHT	HEAD NOD	STOP
B	HEAD TILT RIGHT	LEFT ELBOW DOWN	LEFT ARM FRET	RIGHT FOOT TAP	MOUTH	RIGHT ELBOW UP	RIGHT WRIST DOWN	
C	RIGHT ARM OUT							REWIND

DCJETH_GS.WK1

Section V
Appendix

SALLY INDUSTRIES, INC.

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: DANIEL

Date: DECEMBER 18, 1991

Output Connector
#2

	Output			
	1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)	26 »	« 1	B+ (White)	**W**
Bit 1	Right elbow up	27 »	« 2	Eyes left	Bit 1
Bit 2	Right arm out	28 »	« 3	Eyes right	Bit 2
Bit 3	Left rib	29 »	« 4	Eyes blink	Bit 3
Bit 4	Right rib	30 »	« 5	Head tilt left	Bit 4
Bit 5	Waist left	31 »	« 6	Head tilt right	Bit 5
Bit 6		32 »	« 7	Head nod	Bit 6
Bit 7		33 »	« 8		Bit 7
Bit 8		34 »	« 9	Stop	Bit 8
Z	B+ (White)	35 »	« 10	B+ (White)	**X**
Bit 1		36 »	« 11	Head left	Bit 1
Bit 2		37 »	« 12	Head right	Bit 2
Bit 3		38 »	« 13	Left shoulder up	Bit 3
Bit 4		39 »	« 14	Left arm out	Bit 4
Bit 5		40 »	« 15	Mouth	Bit 5
Bit 6		41 »	« 16	Left elbow up	Bit 6
Bit 7		42 »	« 17	Left wrist up	Bit 7
Bit 8		43 »	« 18		Bit 8
Audio Source Control	B+ (White)	44 »	« 19	B+ (White)	**Audio Source Output**
	Start	45 »	« 20	NC	
	Rewind	46 »	« 21	NC	
	Stop	47 »	« 22	Speaker Common	
	Pause	48 »	« 23	Speaker Output 1	
	Common	49 »	« 24	Speaker Output 2	
	GROUND	50 »	« 25	GROUND	

SALLY INDUSTRIES, INC.

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: SCRATCHMO

Date: DECEMBER 18, 1991

Output Connector
#4

Output

	1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)	26 »	« 1	B+ (White)	W
Bit 1	Sway right	27 »	« 2	Eyes left	Bit 1
Bit 2	Right foot tap	28 »	« 3	Eyes right	Bit 2
Bit 3	Right arm out	29 »	« 4	Eyes blink	Bit 3
Bit 4		30 »	« 5	Head tilt left	Bit 4
Bit 5		31 »	« 6	Head tilt right	Bit 5
Bit 6		32 »	« 7	Head nod	Bit 6
Bit 7		33 »	« 8	Head left	Bit 7
Bit 8		34 »	« 9	Head right	Bit 8
Z	B+ (White)	35 »	« 10	B+ (White)	X
Bit 1		36 »	« 11	Left shoulder up	Bit 1
Bit 2		37 »	« 12	Left arm out	Bit 2
Bit 3		38 »	« 13	Left elbow up	Bit 3
Bit 4		39 »	« 14	Left wrist out	Bit 4
Bit 5		40 »	« 15	Mouth	Bit 5
Bit 6		41 »	« 16	Right shoulder up	Bit 6
Bit 7		42 »	« 17	Left rib	Bit 7
Bit 8		43 »	« 18	Right rib	Bit 8
Audio Source Control	B+ (White)	44 »	« 19	B+ (White)	**Audio Source Output**
	Start	45 »	« 20	NC	
	Rewind	46 »	« 21	NC	
	Stop	47 »	« 22	Speaker Common	
	Pause	48 »	« 23	Speaker Output 1	
	Common	49 »	« 24	Speaker Output 2	
	GROUND	50 »	« 25	GROUND	

DCSCR_PO.WK1 Dec–91

SALLY INDUSTRIES, INC.

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: COL. BEAUFORT

Date: DECEMBER 18, 1991

Output Connector
#3

	Output 1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)		26 »	« 1		B+ (White)	W
	Bit 1	Left foot tap	27 »	« 2	Eyes left	Bit 1	
	Bit 2		28 »	« 3	Eyes right	Bit 2	
	Bit 3		29 »	« 4	Hat up	Bit 3	
	Bit 4		30 »	« 5	Head tilt left	Bit 4	
	Bit 5		31 »	« 6	Head tilt right	Bit 5	
	Bit 6		32 »	« 7	Head nod	Bit 6	
	Bit 7		33 »	« 8	Head left	Bit 7	
	Bit 8		34 »	« 9	Head right	Bit 8	
Z	B+ (White)		35 »	« 10		B+ (White)	X
	Bit 1		36 »	« 11	Left arm/fret	Bit 1	
	Bit 2		37 »	« 12	Left elbow up	Bit 2	
	Bit 3		38 »	« 13	Right arm out	Bit 3	
	Bit 4		39 »	« 14	Right elbow/wrist	Bit 4	
	Bit 5		40 »	« 15	Mouth	Bit 5	
	Bit 6		41 »	« 16	Left rib	Bit 6	
	Bit 7		42 »	« 17	Right rib	Bit 7	
	Bit 8		43 »	« 18	Sway right	Bit 8	
Audio Source Control	B+ (White)		44 »	« 19		B+ (White)	Audio Source Output
	Start		45 »	« 20		NC	
	Rewind		46 »	« 21		NC	
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

SALLY INDUSTRIES, INC.

ACS–50

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: JETHRO

Date: DECEMBER 18, 1991

CARD C		B+ (White)	26 »	« 1		B+ (White)	**CARD A**
	Bit 1	RIGHT ARM OUT	27 »	« 2	EYES LEFT	Bit 1	
	Bit 2		28 »	« 3	EYES RIGHT	Bit 2	
	Bit 3		29 »	« 4	EYES BLINK	Bit 3	
	Bit 4		30 »	« 5	EYE BROWS UP	Bit 4	
	Bit 5		31 »	« 6	hEAD TURN LEFT	Bit 5	
	Bit 6		32 »	« 7	hEAD TURN RIGHT	Bit 6	
	Bit 7		33 »	« 8	HEAD NOD	Bit 7	
	Bit 8	(REWIND)	34 »	« 9	STOP	Bit 8	
		B+ (White)	35 »	« 10		B+ (White)	**CARD B**
			36 »	« 11	HEAD TILT RIGHT	Bit 1	
			37 »	« 12	LEFT ELBOW DOWN	Bit 2	
			38 »	« 13	LEFT ARM FRET	Bit 3	
			39 »	« 14	RIGHT FOOT TAP	Bit 4	
			40 »	« 15	MOUTH	Bit 5	
			41 »	« 16	RIGHT ELBOW UP	Bit 6	
			42 »	« 17	RIGHT WRIST DOWN	Bit 7	
			43 »	« 18		Bit 8	
Audio Source Control	B+ (White)		44 »	« 19		B+ (White)	**Audio Source Output**
	Start		45 »	« 20		NC	
	Rewind		46 »	« 21		NC	
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

SALLY INDUSTRIES, INC.

ACS–50

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: MUZAK SYSTEM CONTROL

Date: DECEMBER 18, 1991

CARD C	B+ (White)		26 »	« 1	B+ (White)	**CARD A**
	Bit 1		27 »	« 2	Bit 1	
	Bit 2		28 »	« 3	Bit 2	
	Bit 3		29 »	« 4	Bit 3	
	Bit 4		30 »	« 5	Bit 4	
	Bit 5		31 »	« 6	Bit 5	
	Bit 6	House control – Muzak	32 »	« 7	Bit 6	
	Bit 7		33 »	« 8	Bit 7	
	Bit 8		34 »	« 9	Bit 8	
	B+ (White)		35 »	« 10	B+ (White)	**CARD B**
			36 »	« 11	Bit 1	
			37 »	« 12	Bit 2	
			38 »	« 13	Bit 3	
			39 »	« 14	Bit 4	
			40 »	« 15	Bit 5	
			41 »	« 16	Bit 6	
			42 »	« 17	Bit 7	
			43 »	« 18	Bit 8	
Audio	B+ (White)		44 »	« 19	B+ (White)	**Audio**
Source	Start		45 »	« 20	NC	**Source**
Control	Rewind		46 »	« 21	NC	**Output**
	Stop		47 »	« 22	Speaker Common	
	Pause		48 »	« 23	Speaker Output 1	
	Common		49 »	« 24	Speaker Output 2	
	GROUND		50 »	« 25	GROUND	

SALLY INDUSTRIES, INC.

ACS-50

50-Pin Connector Assignments

Project: CELEBRATION STATION

Character: HOUSE LIGHT DIMMER

Date: DECEMBER 18, 1991

CARD C	B+ (White)		26 »	« 1		B+ (White)	**CARD A**
	Bit 1		27 »	« 2		Bit 1	
	Bit 2		28 »	« 3		Bit 2	
	Bit 3		29 »	« 4		Bit 3	
	Bit 4		30 »	« 5		Bit 4	
	Bit 5		31 »	« 6		Bit 5	
	Bit 6	House control—House light	32 »	« 7		Bit 6	
	Bit 7		33 »	« 8		Bit 7	
	Bit 8		34 »	« 9		Bit 8	
	B+ (White)		35 »	« 10		B+ (White)	**CARD B**
			36 »	« 11		Bit 1	
			37 »	« 12		Bit 2	
			38 »	« 13		Bit 3	
			39 »	« 14		Bit 4	
			40 »	« 15		Bit 5	
			41 »	« 16		Bit 6	
			42 »	« 17		Bit 7	
			43 »	« 18		Bit 8	
Audio Source Control	B+ (White)		44 »	« 19		B+ (White)	**Audio Source Output**
	Start		45 »	« 20		NC	
	Rewind		46 »	« 21		NC	
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: DOG SET LIGHTS

Date: DECEMBER 18, 1991

Output Connector
#1

Output

	1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)		26 »	« 1	B+ (White)	W
Bit 1			27 »	« 2		Bit 1
Bit 2			28 »	« 3		Bit 2
Bit 3			29 »	« 4		Bit 3
Bit 4			30 »	« 5		Bit 4
Bit 5			31 »	« 6		Bit 5
Bit 6			32 »	« 7		Bit 6
Bit 7			33 »	« 8		Bit 7
Bit 8			34 »	« 9		Bit 8
Z	B+ (White)		35 »	« 10	B+ (White)	X
Bit 1			36 »	« 11		Bit 1
Bit 2			37 »	« 12		Bit 2
Bit 3			38 »	« 13		Bit 3
Bit 4			39 »	« 14		Bit 4
Bit 5			40 »	« 15		Bit 5
Bit 6			41 »	« 16		Bit 6
Bit 7			42 »	« 17		Bit 7
Bit 8		DOG SET LIGHTS	43 »	« 18		Bit 8
Audio Source Control	B+ (White)		44 »	« 19	B+ (White)	Audio Source Output
	Start		45 »	« 20	NC	
	Rewind		46 »	« 21	NC	
	Stop		47 »	« 22	Speaker Common	
	Pause		48 »	« 23	Speaker Output 1	
	Common		49 »	« 24	Speaker Output 2	
	GROUND		50 »	« 25	GROUND	

DCDSL.WK1 Dec–91

SALLY INDUSTRIES, INC.

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: DOG CURTAIN

Date: DECEMBER 18, 1991

Output Connector
#1

Output

	1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)		26 »	« 1		B+ (White)	**W**
	Bit 1		27 »	« 2		Bit 1	
	Bit 2		28 »	« 3		Bit 2	
	Bit 3		29 »	« 4		Bit 3	
	Bit 4		30 »	« 5		Bit 4	
	Bit 5		31 »	« 6		Bit 5	
	Bit 6		32 »	« 7		Bit 6	
	Bit 7		33 »	« 8		Bit 7	
	Bit 8		34 »	« 9		Bit 8	
Z	B+ (White)		35 »	« 10		B+ (White)	**X**
	Bit 1		36 »	« 11		Bit 1	
	Bit 2		37 »	« 12		Bit 2	
	Bit 3		38 »	« 13		Bit 3	
	Bit 4		39 »	« 14		Bit 4	
	Bit 5		40 »	« 15		Bit 5	
	Bit 6		41 »	« 16		Bit 6	
	Bit 7	DOG CURTAIN	42 »	« 17		Bit 7	
	Bit 8		43 »	« 18		Bit 8	
Audio Source Control	B+ (White)		44 »	« 19		B+ (White)	**Audio Source Output**
	Start		45 »	« 20		NC	
	Rewind		46 »	« 21		NC	
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

DCDCURPO.WK1 Dec–91

SALLY INDUSTRIES, INC.

ACS−50

50−Pin Connector Assignments

Project: CELEBRATION STATION

Character: JETHRO CURTAIN CONTROL

Date: DECEMBER 18, 1991

CARD C	B+ (White)		26 »	« 1		B+ (White)	**CARD A**
	Bit 1		27 »	« 2		Bit 1	
	Bit 2		28 »	« 3		Bit 2	
	Bit 3		29 »	« 4		Bit 3	
	Bit 4		30 »	« 5		Bit 4	
	Bit 5		31 »	« 6		Bit 5	
	Bit 6		32 »	« 7		Bit 6	
	Bit 7	PIG CURTAIN	33 »	« 8		Bit 7	
	Bit 8		34 »	« 9		Bit 8	
	B+ (White)		35 »	« 10		B+ (White)	**CARD B**
			36 »	« 11		Bit 1	
			37 »	« 12		Bit 2	
			38 »	« 13		Bit 3	
			39 »	« 14		Bit 4	
			40 »	« 15		Bit 5	
			41 »	« 16		Bit 6	
			42 »	« 17		Bit 7	
			43 »	« 18		Bit 8	
Audio	B+ (White)		44 »	« 19		B+ (White)	**Audio**
Source	Start		45 »	« 20		NC	**Source**
Control	Rewind		46 »	« 21		NC	**Output**
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

SALLY INDUSTRIES, INC.

ACS–50

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: JETHRO SET

Date: DECEMBER 18, 1991

CARD C	B+ (White)		26 »	« 1		B+ (White)	**CARD A**
	Bit 1		27 »	« 2		Bit 1	
	Bit 2		28 »	« 3		Bit 2	
	Bit 3		29 »	« 4		Bit 3	
	Bit 4		30 »	« 5		Bit 4	
	Bit 5		31 »	« 6		Bit 5	
	Bit 6		32 »	« 7		Bit 6	
	Bit 7		33 »	« 8		Bit 7	
	Bit 8		34 »	« 9		Bit 8	
	B+ (White)		35 »	« 10		B+ (White)	**CARD B**
			36 »	« 11		Bit 1	
			37 »	« 12		Bit 2	
			38 »	« 13		Bit 3	
			39 »	« 14		Bit 4	
			40 »	« 15		Bit 5	
			41 »	« 16		Bit 6	
			42 »	« 17		Bit 7	
			43 »	« 18	MAIL BOX/ B–DAY SIGN	Bit 8	
Audio	B+ (White)		44 »	« 19		B+ (White)	**Audio**
Source	Start		45 »	« 20		NC	**Source**
Control	Rewind		46 »	« 21		NC	**Output**
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

DCJSETPO.WK1 Dec–91

SALLY INDUSTRIES, INC.

ACS−50

50−Pin Connector Assignments

Project: CELEBRATION STATION

Character: JETHRO/THEATRICAL LIGHT DIMMER

Date: DECEMBER 18, 1991

CARD C	B+ (White)		26 »	« 1		B+ (White)	**CARD A**
	Bit 1		27 »	« 2		Bit 1	
	Bit 2	LIGHT #1 PIG SPOT	28 »	« 3		Bit 2	
	Bit 3	LIGHT #2 WHITE WASH	29 »	« 4		Bit 3	
	Bit 4	LIGHT #3 RED WASH	30 »	« 5		Bit 4	
	Bit 5	LIGHT #4 BLUE WASH	31 »	« 6		Bit 5	
	Bit 6		32 »	« 7		Bit 6	
	Bit 7		33 »	« 8		Bit 7	
	Bit 8		34 »	« 9		Bit 8	
	B+ (White)		35 »	« 10		B+ (White)	**CARD B**
			36 »	« 11		Bit 1	
			37 »	« 12		Bit 2	
			38 »	« 13		Bit 3	
			39 »	« 14		Bit 4	
			40 »	« 15		Bit 5	
			41 »	« 16		Bit 6	
			42 »	« 17		Bit 7	
			43 »	« 18		Bit 8	
Audio Source Control	B+ (White)		44 »	« 19		B+ (White)	**Audio Source Output**
	Start		45 »	« 20		NC	
	Rewind		46 »	« 21		NC	
	Stop		47 »	« 22		Speaker Common	
	Pause		48 »	« 23		Speaker Output 1	
	Common		49 »	« 24		Speaker Output 2	
	GROUND		50 »	« 25		GROUND	

SALLY INDUSTRIES, INC.

Valve Board Pin Assignments

Project Name: CELEBRATION STATION/TULSA, OK.
Character Name: JETHRO P. HOGG
Date: MARCH 12, 1993

REGULATED @ ps
85

	PIN	COLOR	FUNCTION/MOVEMENT	50-Pin Connector #	Flow Restrictor
Valve Board #1:	1	White	B+ (24 vdc)	1	
	2	Red			
	3	Yellow	EYES LEFT	2	*.006
	4	Brown	EYES RIGHT	3	*.006
	5	Blue	EYES BLINK	4	*.012
	6	Orange	EYE BROWS UP	5	.004
	7	Green	HEAD TILT RIGHT	11	*.008
	8	Black	MOUTH	15	*.016
Valve Board #2:	1	White	B+ (24 vdc)	10	
	2	Red			
	3	Yellow	HEAD LEFT	6	.006
	4	Brown	HEAD RIGHT	7	.006
	5	Blue	HEAD NOD	8	*.008
	6	Orange	LEFT ELBOW DOWN	12	*.016
	7	Green	LEFT ARM/FRET	13	
	8	Black	RIGHT FOOT TAP	14	*.016
Valve Board #3:	1	White	B+ (24 vdc)	26	
	2	Red			
	3	Yellow	RIGHT ELBOW UP	16	*.010
	4	Brown	RIGHT WRIST DOWN	17	*.016
	5	Blue	RIGHT ARM OUT	27	*.010
	6	Orange			
	7	Green			
	8	Black			
Valve Board #4:	1	White	B+ (24 vdc)		
	2	Red			
	3	Yellow			
	4	Brown			
	5	Blue			
	6	Orange			
	7	Green			
	8	Black			

Regulators Assigned as follows:

Accumulator

SALLY INDUSTRIES, INC.

Valve Board Pin Assignments

Project Name: CELEBRATION STATION
Character Name: Daniel
Date: 05 MARCH 1992

REGULATED @ psi
90

	PIN	COLOR	FUNCTION/MOVEMENT	50–Pin Connector #	Flow Restrictor
Valve Board #1:	1	White	B+ (24 vdc)	1	
	2	Red			
	3	Yellow	Eyes left	2	.004
	4	Brown	Eyes right	3	.004
	5	Blue	Eyes blink	4	.010
	6	Orange	Head tilt left	5	*.010
	7	Green	Head tilt right	6	*.010
	8	Black	Mouth	15	
Valve Board #2:	1	White	B+ (24 vdc)	10	
	2	Red			
	3	Yellow	Head left	11	*.012
	4	Brown	Head right	12	*.012
	5	Blue	Head nod	7	*.010
	6	Orange			
	7	Green	Left arm out	14	*.010
	8	Black	Left elbow up	16	*.016
Valve Board #3:	1	White	B+ (24 vdc)	26	
	2	Red			
	3	Yellow	Left wrist up	17	.012
	4	Brown	Right elbow up	27	*.016
	5	Blue	Right arm out	28	*.010
	6	Orange	Left rib	29	*.012
	7	Green	Right rib	30	*.012
	8	Black	Waist left	31	.010
Valve Board #4:	1	White	B+ (24 vdc)		
	2	Red			
	3	Yellow			
	4	Brown			
	5	Blue			
	6	Orange			
	7	Green			
	8	Black			

Regulators Assigned as follows:

1) Eye center, blink, head nod. AVT 24–10
2) Left and right rib. AVT 24–10
3) Head tilt left, head tilt right. AVT 24–10
4) Left arm out, left elbow, left wrist, right arm out, right elbow. AVT 32–16
5) Head center, waist. AVT24–10
6) Mouth. AVT 17–3

SALLY INDUSTRIES, INC.

Valve Board Pin Assignments

Project Name: CELEBRATION STATION
Character Name: COL. BEAUFORT
Date: DECEMBER 18, 1991

REGULATED @ psi
90

	PIN	COLOR	FUNCTION/MOVEMENT	50–Pin Connector #	Flow Restrictor
Valve Board #1:	1	White	B+ (24 vdc)	1	
	2	Red			
	3	Yellow	Eyes left	2	.004
	4	Brown	Eyes right	3	.004
	5	Blue	Hat up	4	.010
	6	Orange	Head tilt left	5	.007
	7	Green	Head tilt right	6	.007
	8	Black	Mouth	15	
Valve Board #2:	1	White	B+ (24 vdc)	10	
	2	Red			
	3	Yellow	Head left	8	*.016
	4	Brown	Head right	9	*.016
	5	Blue	Head nod	7	*.012
	6	Orange	Left arm/fret	11	Needle valve
	7	Green	Left elbow down	12	*.016
	8	Black	Right arm out	13	*.016
Valve Board #3:	1	White	B+ (24 vdc)	19	
	2	Red			
	3	Yellow	Right elbow/wrist up	14	
	4	Brown	Left rib	16	*.016
	5	Blue	Right rib	17	*.016
	6	Orange	Sway	18	*.016
	7	Green	Left foot tap	27	
	8	Black			
Valve Board #4:	1	White	B+ (24 vdc)		
	2	Red			
	3	Yellow			
	4	Brown			
	5	Blue			
	6	Orange			
	7	Green			
	8	Black			

Regulators Assigned as follows:

1) Eye center, head nod, left rib, sway, foot tap. AVT 32–16
2) Left elbow, right rib. AVT 24–10
3) Head center, hat, right elbow. AVT 32–16
4) Right arm out. AVT 24–10
5) Mouth. AVT 17–3

SALLY INDUSTRIES, INC.

Valve Board Pin Assignments

Project Name: Celebration Station
Character Name: Scratchmo
Date: 18 DECEMBER 91

REGULATED @ psi
90

	PIN	COLOR	FUNCTION/MOVEMENT	50-Pin Connector #	Flow Restrictor
Valve Board #1:	1	White	B+ (24 vdc)	1	
	2	Red			
	3	Yellow	Eyes left	2	.004
	4	Brown	Eyes right	3	.004
	5	Blue	Eyes blink	4	.010
	6	Orange	Head tilt left	5	.007
	7	Green	Head tilt right	6	.007
	8	Black	Mouth	15	
Valve Board #2:	1	White	B+ (24 vdc)	10	
	2	Red			
	3	Yellow	Head left	8	*.016
	4	Brown	Head right	9	*.016
	5	Blue	Head nod	7	*.012
	6	Orange	Left shoulder up	11	*.016
	7	Green	Left arm out	12	*.012
	8	Black	Left elbow up	13	*.012
Valve Board #3:	1	White	B+ (24 vdc)	19	
	2	Red	Right shoulder up	16	*.016
	3	Yellow	Right arm out	29	*.010
	4	Brown	Left rib	17	*.012
	5	Blue	Right rib	18	*.012
	6	Orange	Sway	27	*.016
	7	Green	Right foot tap	28	
	8	Black	Left wrist out	14	*.010
Valve Board #4:	1	White	B+ (24 vdc)		
	2	Red			
	3	Yellow			
	4	Brown			
	5	Blue			
	6	Orange			
	7	Green			
	8	Black			

Regulators Assigned as follows:

1) Eyes center, blink, head nod. AVT 24–10
2) Left and right rib, foot tap, sway. AVT 32–16
3) Right shoulder. AVT 24–10
4) Left shoulder, right arm out. AVT 32–16
5) Head center, left arm out, left elbow, left wrist. AVT 32–16
6) Mouth. AVT 17–3

Jethro P. Hogg

Music Tapes

Tape One

Just Because
Stay All Night
The Crawdad Song
Big Rock Candy Mountain
Skip to My Lou
Salty Dog
Highway 40 Blues
Mockingbird Hill
Alabama Jubilee
I'm So Lonesome/Your Cheatin' Heart

Tape Two

Country Roads
King of the Road
Cryin' My Heart Out Over You
Grandma's Feather Bed
Tie a Yellow Ribbon
Thank God I'm a Country Boy
Carolina
Rocky Top
Cotton–Eyed Joe
Mountain Music

Celebration Station
N.S.I. Dimmer Breakdown

Dimmer Pack # 1	B	Watts	
House Lights	C6	1000	
Beau Spot	D1	300	
Scratchmo Spot	D2	300	
Daniel Spot	D3	300	
		1900	Total

Dimmer Pack # 2	B	Watts	
White Wash	D4	600	
Red Wash	D5	900	
Blue Wash	D6	900	
- Spare -			
		2400	Total

Dimmer Pack # 3	B	Watts	
Pig Spot	C2	1000	
White Wash	C3	300	
Red Wash	C4	300	
Blue Wash	C5	300	
		1900	Total

csdim_2.wk1

ACS 2000 TO 50 INTERFACE CABLE PINOUTS

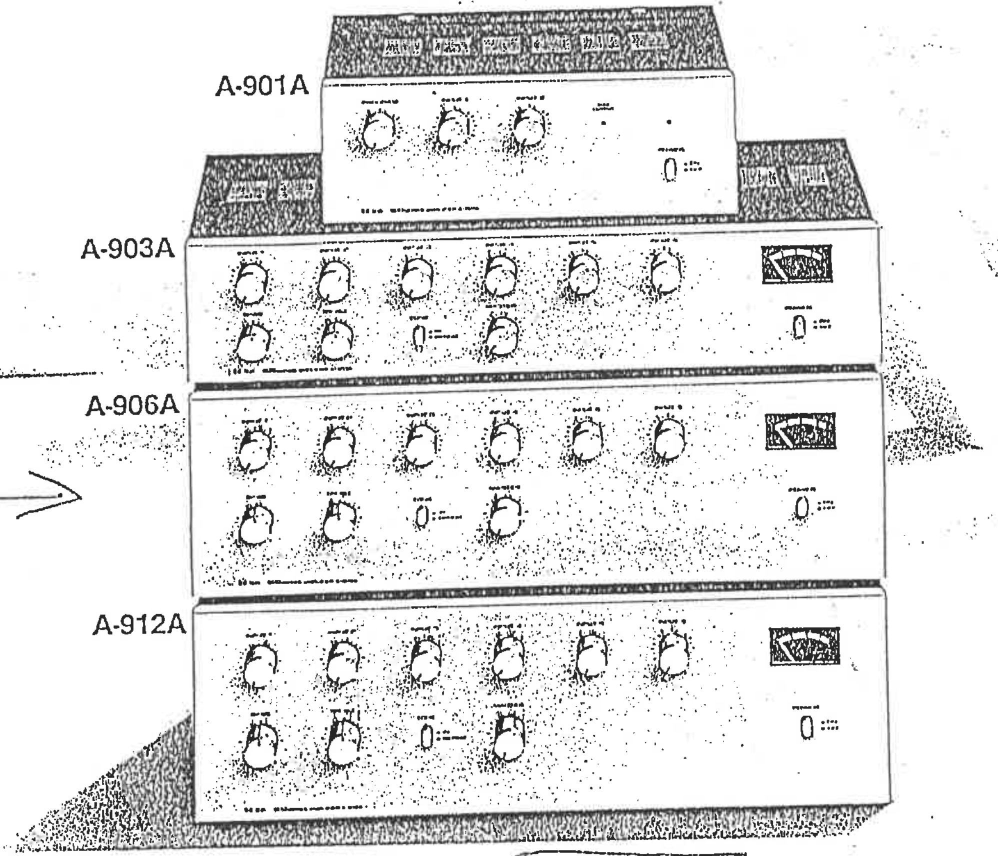
ACS 50 M = ACS 2000 F

PIN #	FUNCTION	PIN #	FUNCTION
1	GND	25	GND
2	A Bit1	2	A Bit1
3	A Bit2	3	A Bit2
4	A Bit3	4	A Bit3
5	A Bit4	5	A Bit4
6	A Bit5	6	A Bit5
7	A Bit6	7	A Bit6
8	A Bit7	8	A Bit7
10 (cut)	GND	10	------
11	B Bit1	11	B Bit1
12	B Bit2	12	B Bit2
13	B Bit3	13	B Bit3
14	B Bit4	14	B Bit4
15	B Bit5	15	B Bit5
16	B Bit6	16	B Bit6
17	B Bit7	17	B Bit7
18	B Bit8	18	B Bit8
26	GND	50	GND
27	C Bit1	27	~~GND~~ C Bit1
28	C Bit2	28	C Bit2
29	C Bit3	29	C Bit3
30	C Bit4	30	C Bit4
31	C Bit5	31	C Bit5
32	C Bit6	32	C Bit6
33	C Bit7	33	C Bit7

34 (cut)

e Toa 900 Series Mixer Power Amplifiers— Variety of Power Ratings, Plus the Flexibility of Plug-In Modules

These four mixer power amplifiers provide a wide selection of output power ratings, assuring sufficient power for each and every system. All models except the A-901A come with separate bass, treble and master gain controls and all accept almost the entire range of available Toa plug-in modules, for optimal system flexibility.



A-901A
Three-Channel 10-Watt Mixer Power Amplifier

- 10W RMS output power.
- 20—20,000Hz frequency response, ±1dB.
- Low distortion and noise level and excellent output regulation.
- Bass and treble controls for Input #1 and Program Input.
- Muting function and protection circuitry.
- Separate output terminals for 4/8 ohms, 25/70 volts.
- Full range of plug-in modules.
- Portable or rack-mounted type.

A-903A
Six-Channel 30-Watt Mixer Power Amplifier

- 30W RMS output power.
- 20—20,000Hz frequency response, ±1dB.
- Low distortion and noise level and excellent output regulation.
- Bass, treble and master gain controls.
- Bridging and signal processing input and output.
- Built-in protection circuitry.
- Separate output terminals for 4/8 ohms, 25/70 volts.
- Full range of plug-in modules.
- Portable or rack-mounted type.

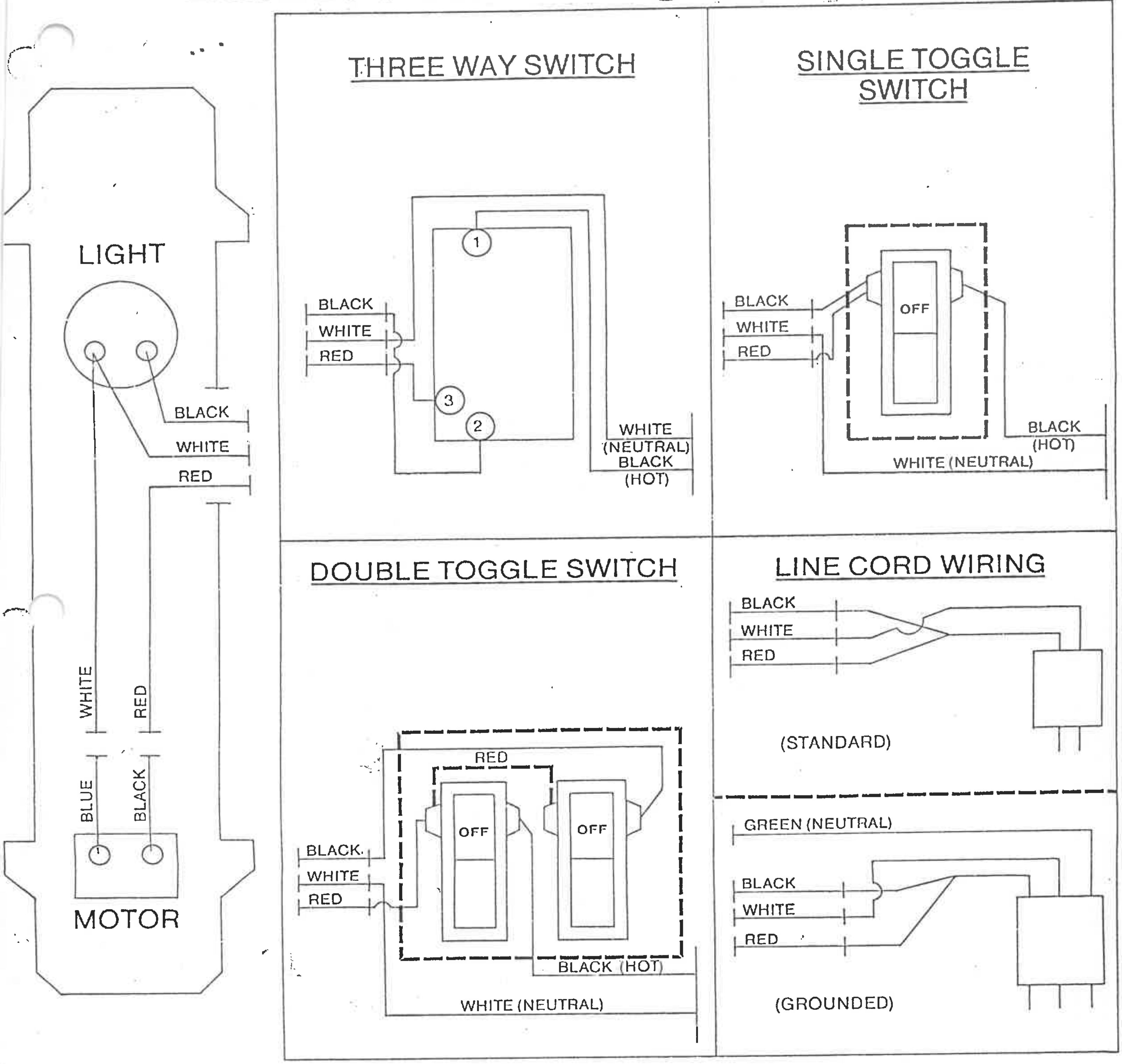
A-906A
Six-Channel 60-Watt Mixer Power Amplifier

- 60W RMS output power.
- 20—20,000Hz frequency response, ±1dB.
- Low distortion and noise level and excellent output regulation.
- Bass, treble and master gain controls.
- Bridging and signal processing input and output.
- Built-in protection circuitry.
- Separate output terminals for 4/8 ohms, 25/70 volts.
- Full range of plug-in modules.
- Portable or rack-mounted type.

A-912A
Six-Channel 120-Watt Mixer Power Amplifier

- 120W RMS output power.
- 20—20,000Hz frequency response, ±1dB.
- Low distortion and noise level and excellent output regulation.
- Bass, treble and master gain controls.
- Bridging and signal processing input and output.
- Built-in protection circuitry.
- Separate output terminals for 4/8 ohms, 25/70 volts.
- Full range of plug-in modules.
- Portable or rack-mounted type.

Barber Pole Wiring Diagram



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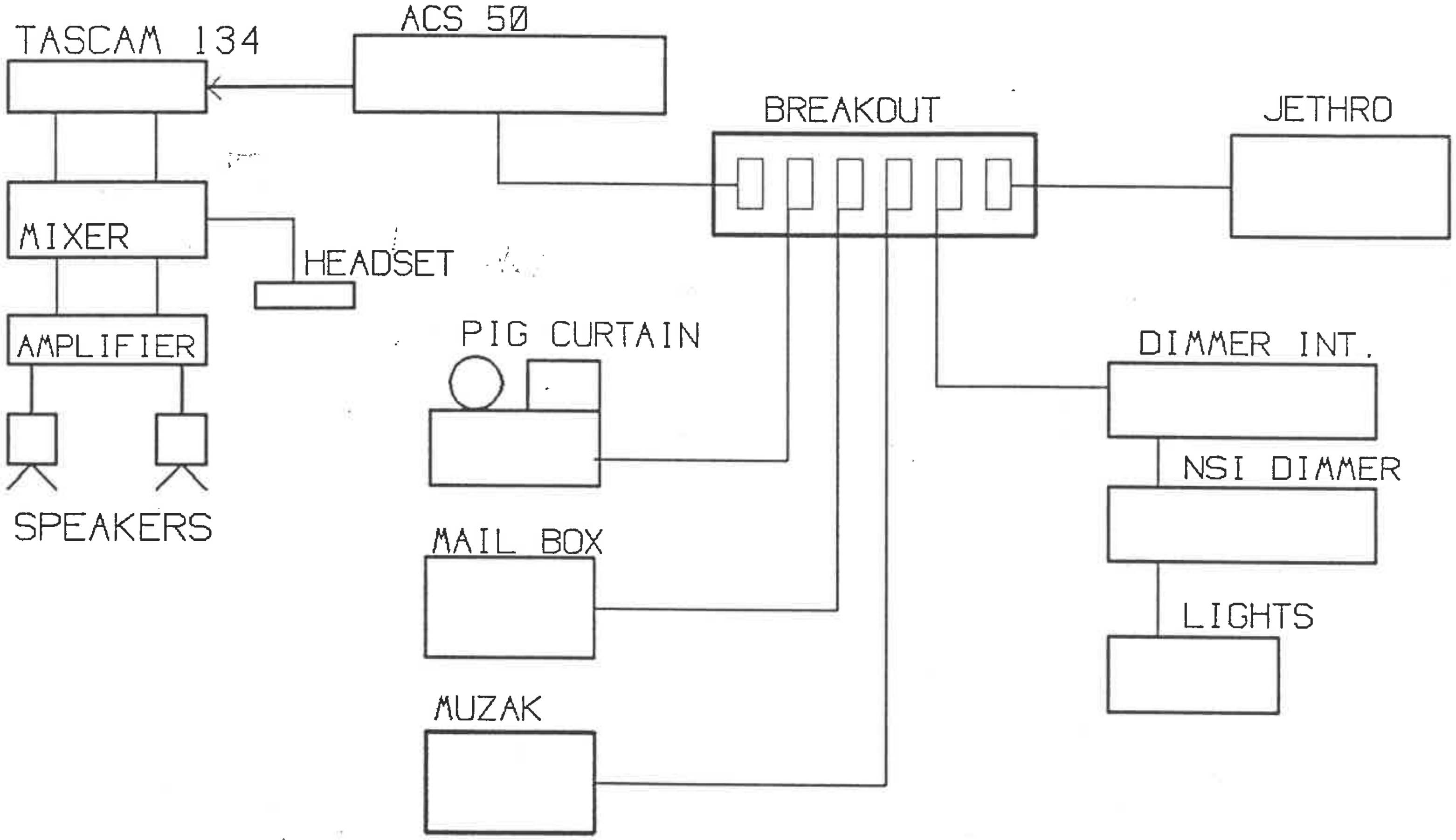

SALLY
CORPORATION

803 Price Street, Jacksonville, FL 32204
Tel: (904) 353-5051 Fax: (904) 353-4489

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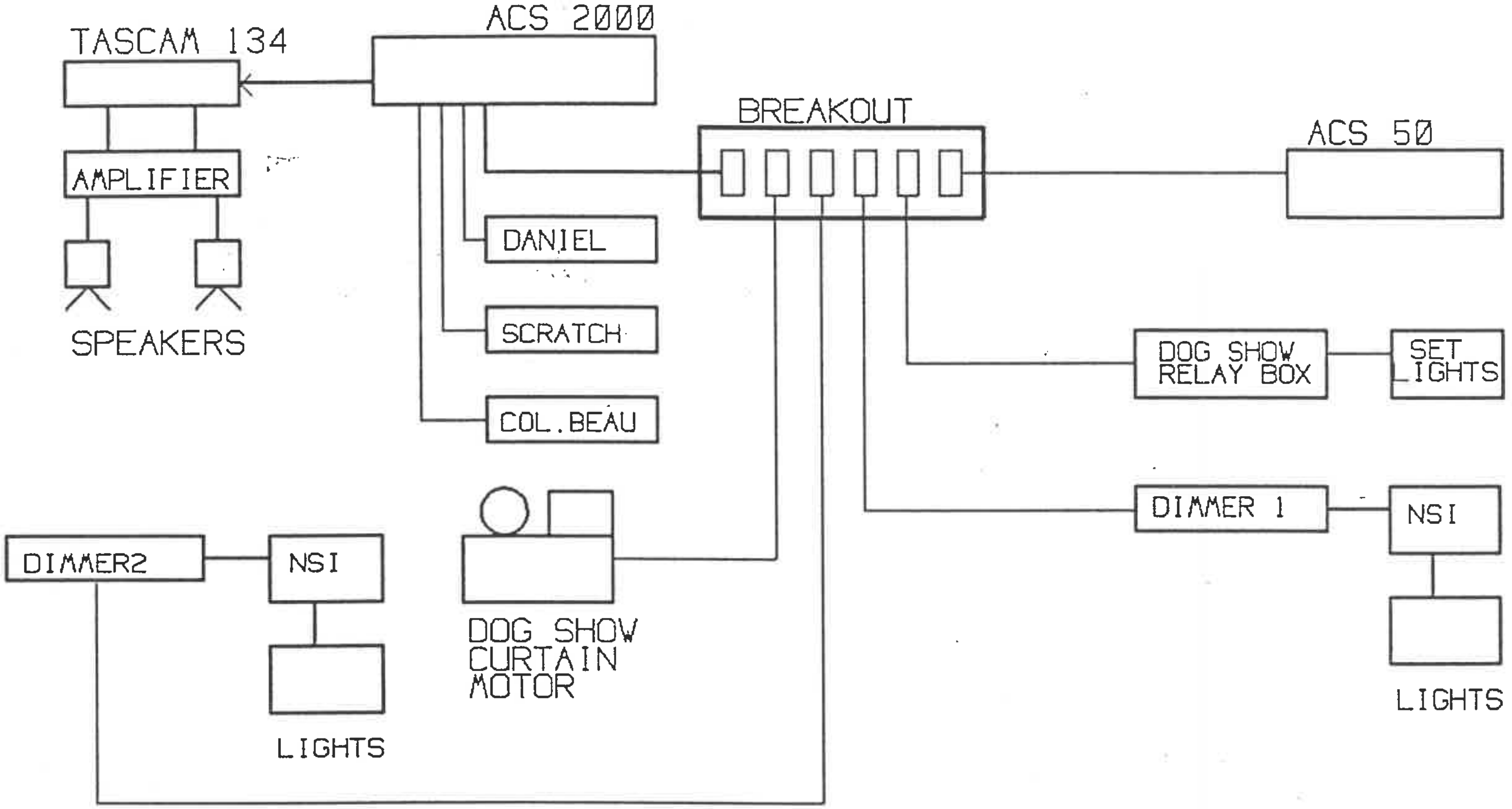
Title ACS 50 BLOCK DIAGRAM		Scale N/A
Client CELEBRATION STATION		
Project CS#10		Proj. No.
Drawn By Y.R.	Approved By	
Drawing No. 2	Rev. 1	Date 3-19-93



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803 Price Street, Jacksonville, FL 32204
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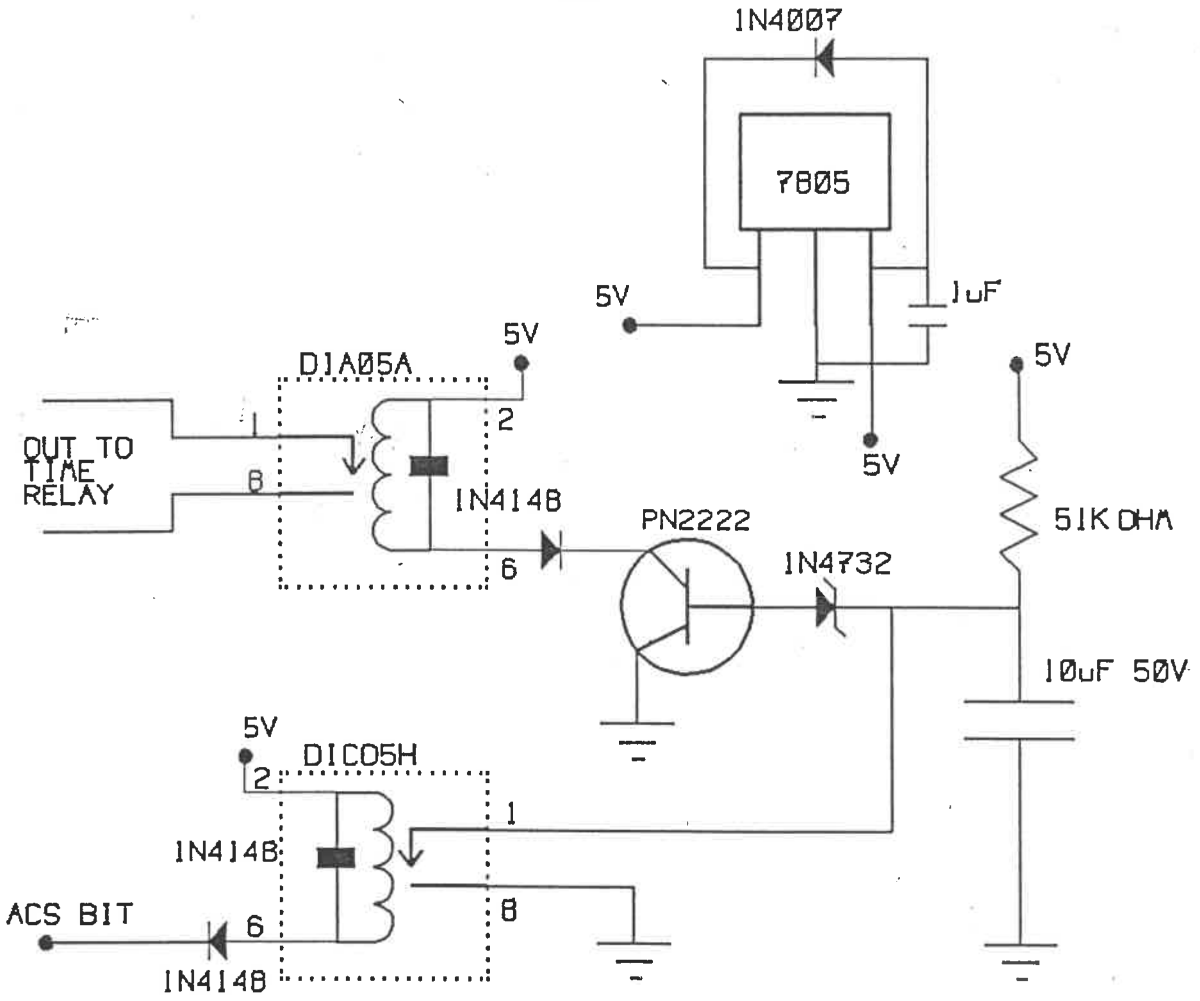
Title: ACS 2000 BLOCK DIAGRAM
Scale: N/A
Client: CELEBRATION STATION
Project: CSH10
Proj. No.:
Drawn By: Y.R.
Approved By: ap
Drawing No.: 2
Rev.: 1
Date: 3-19-93



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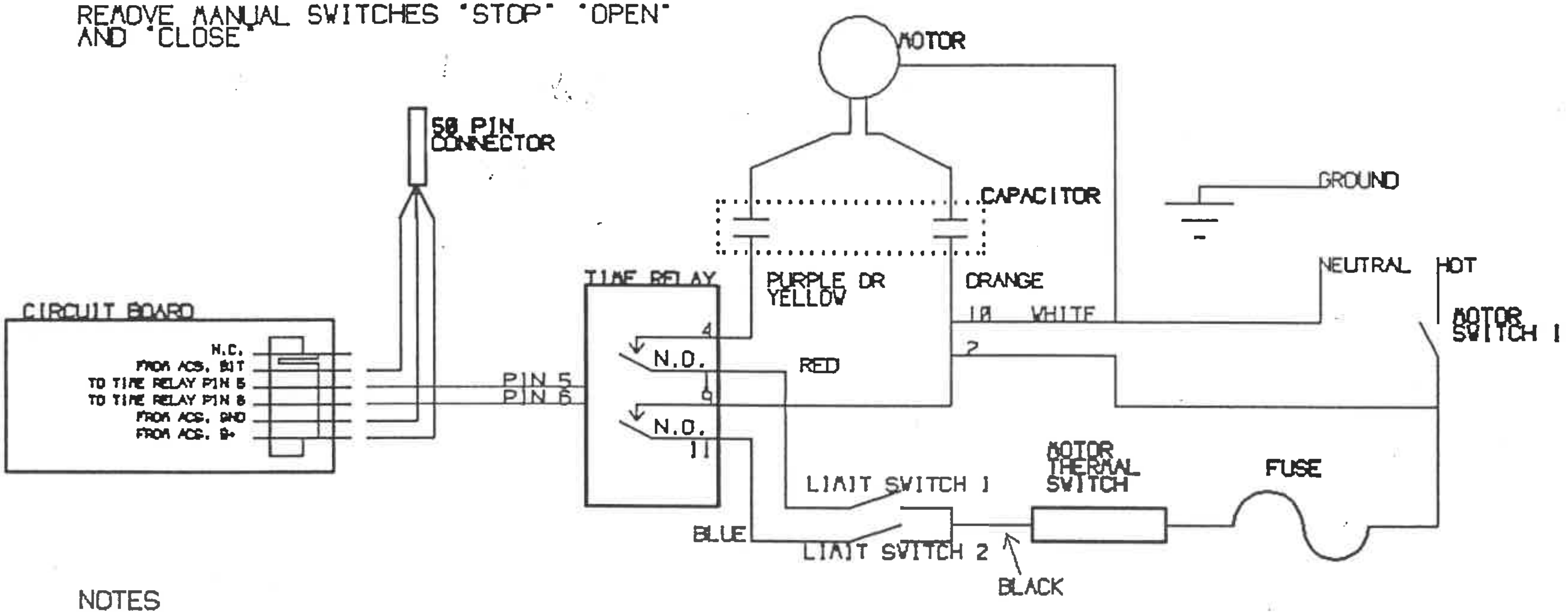
Title CURTAIN MOTOR CIRCUIT
Scale N/A
Client CELEBRATION STATION
Project CS#10
Proj. No.
Drawn By G.R.
Approved By
Drawing No. 3
Rev. 1
Date 3-19-97

NOTES

LIMIT SWITCHES MUST BE WIRED NORMALLY CLOSED

REMOVE MANUAL SWITCHES 'STOP' 'OPEN' AND 'CLOSE'



NOTES

CONNECT WIRE #14 AND #10 TOGETHER. THIS IS AC NEUTRAL IN. (WHITE/BLACK).

CONNECT WIRE #8 AND #5 TOGETHER. THIS IS AC HOT (BLACK/BLACK).

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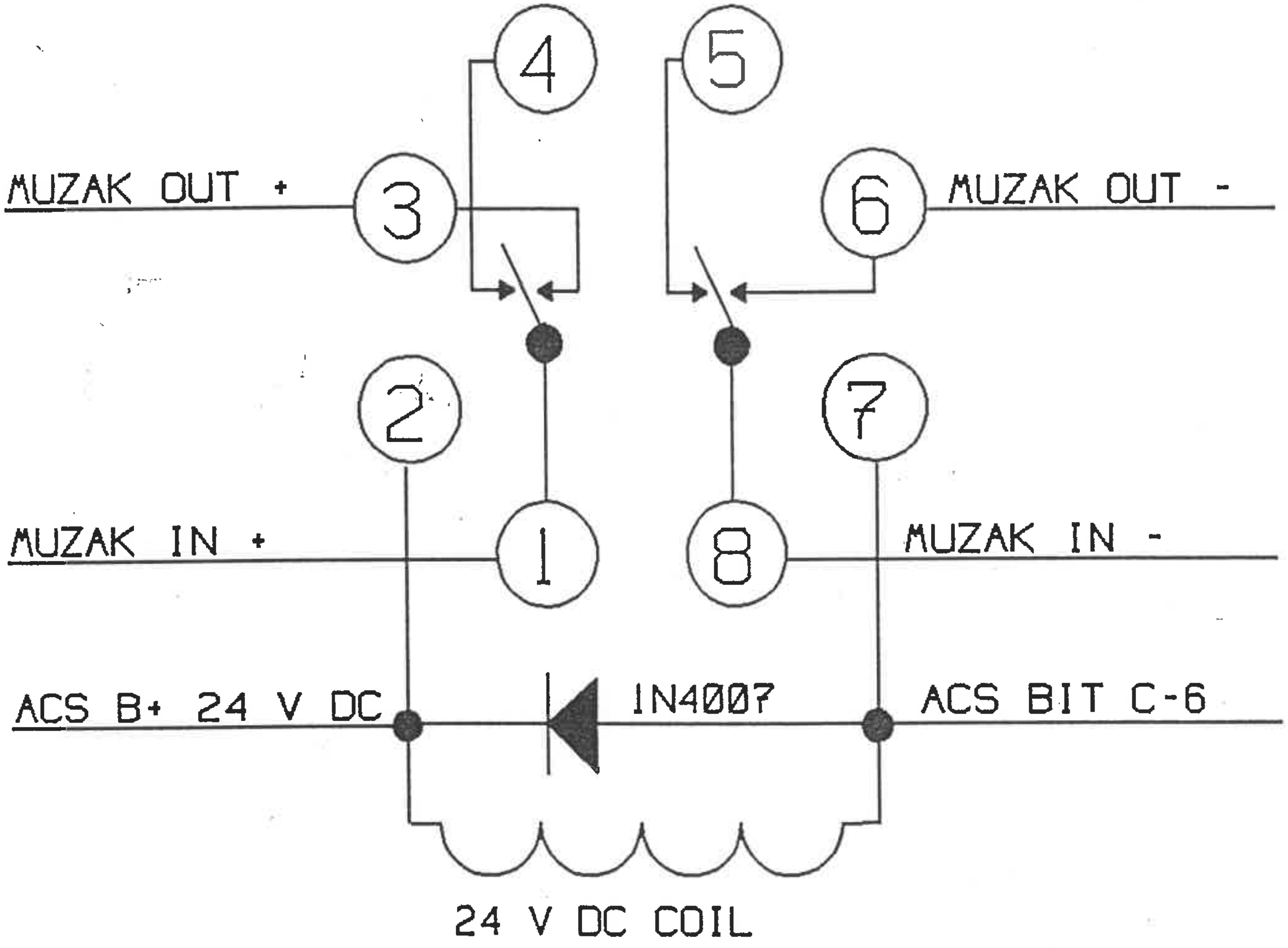
Title CURTAIN MOTOR		Scale N/A
Client CELEBRATION STATION		
Project CSH10		Proj. No.
Drawn By G.R.	Approved By oy	
Drawing No. 4	Rev. 1	Date 3-19-93



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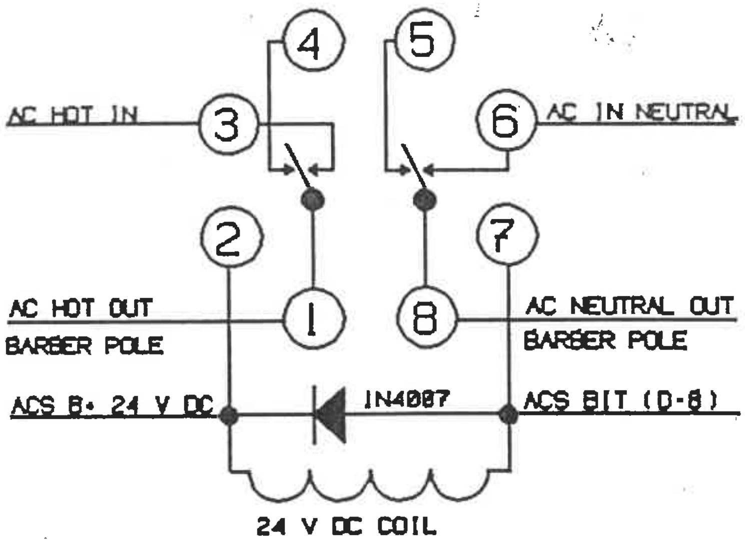
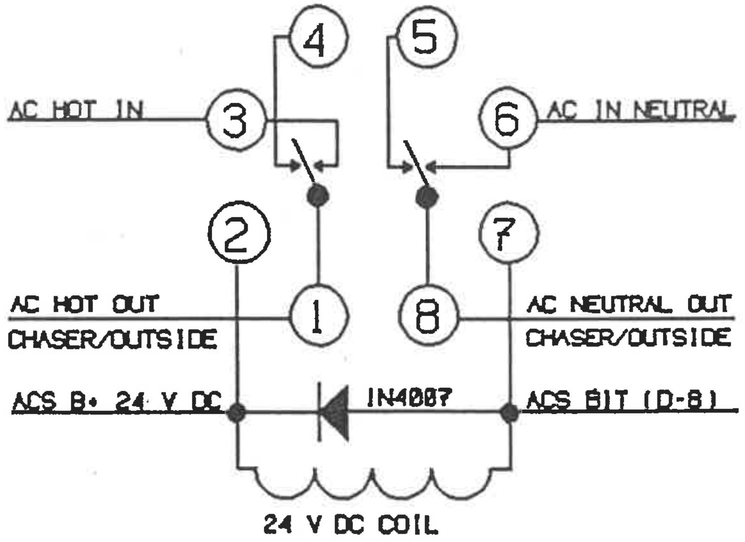
Title MUZAK CONTROL			Scale N/A
Client CELEBRATION STATION			
Project CS#10			Proj. No.
Drawn By Y.R		Approved By	CN
Drawing No. 5	Rev. 1		Date 3-19-93





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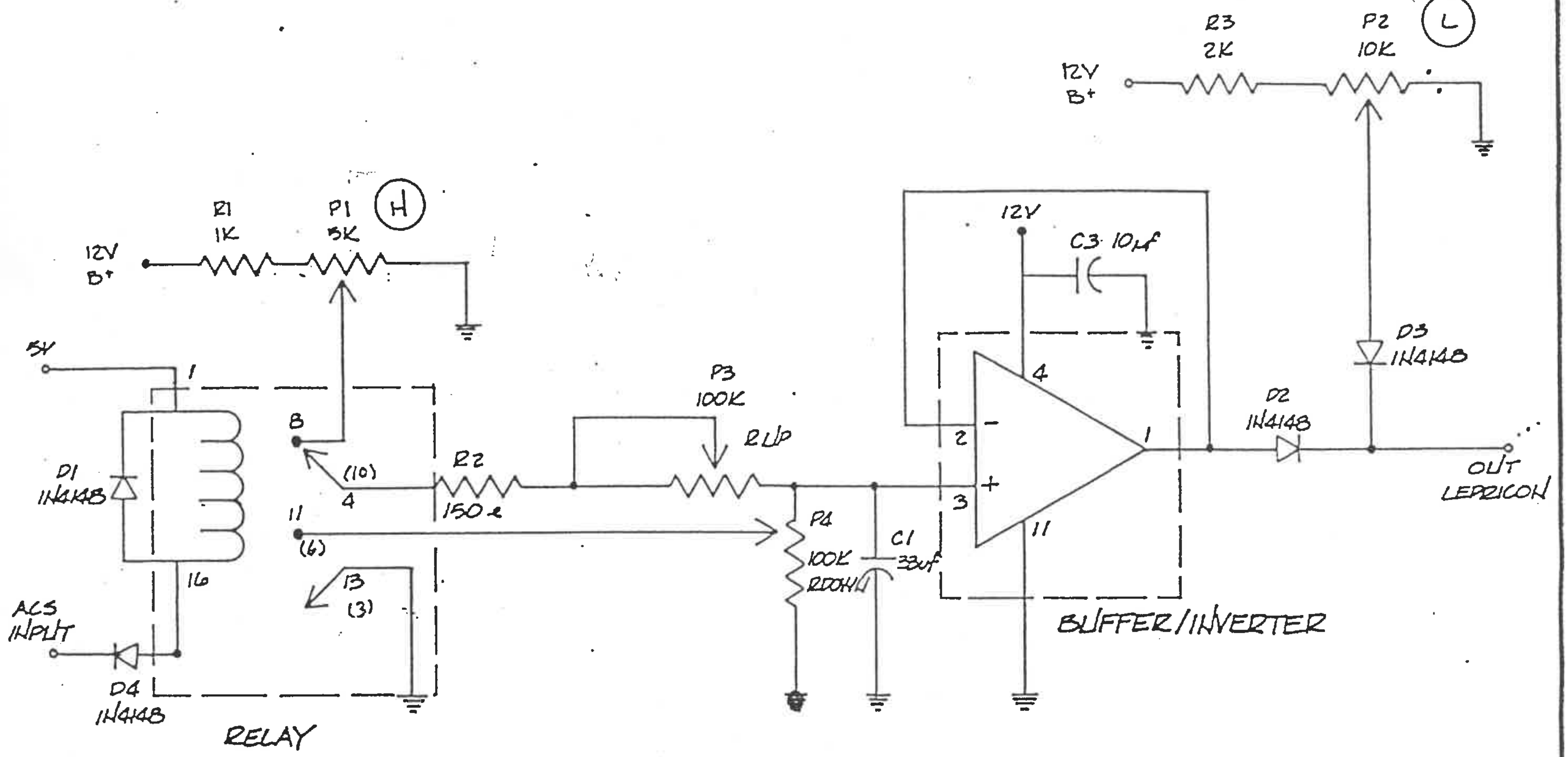
Title Dog SET WIRING		Scale N/A
Client CELEBRATION STATION		
Project CS #10		Proj. No.
Drawn By Y.R.	Approved By ON	
Drawing No. 6	Rev. 1	Date 3-19-93

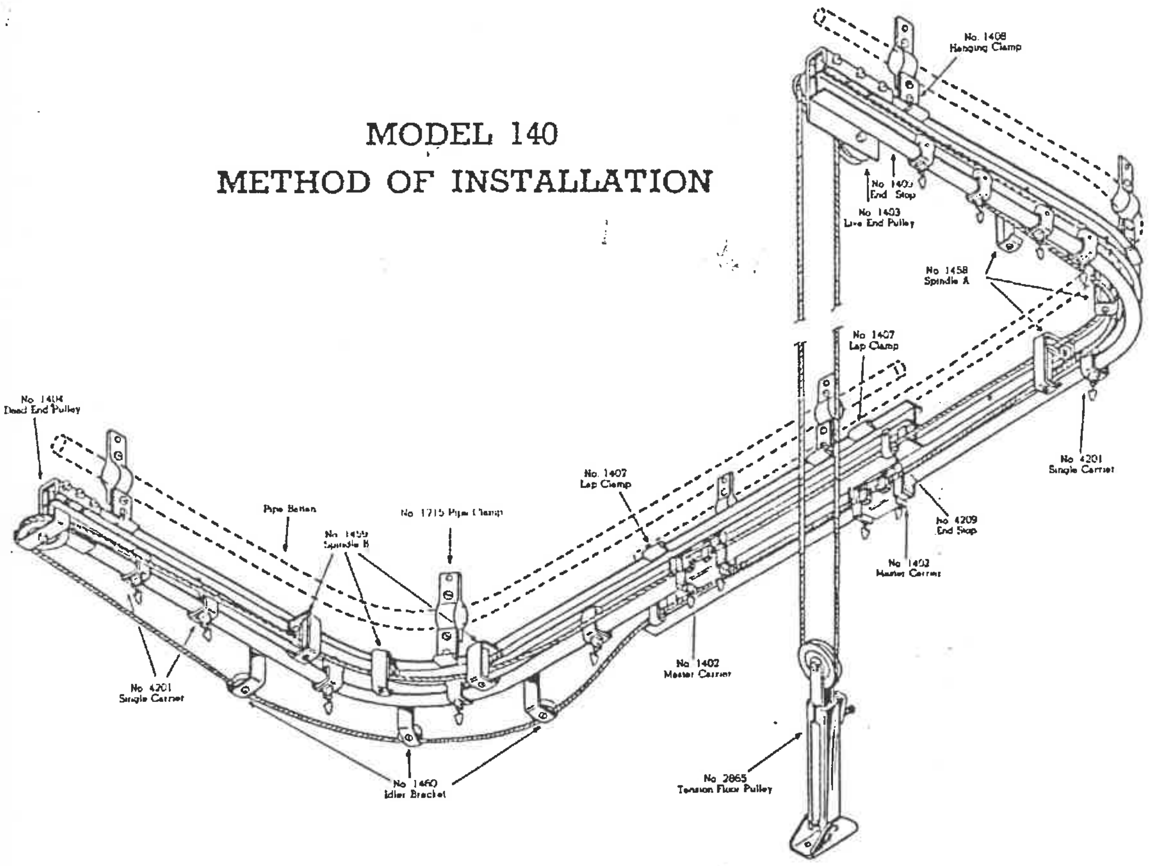


DIMMER CIRCUIT × 4

INDUSTRIES
Audio-Animation inc

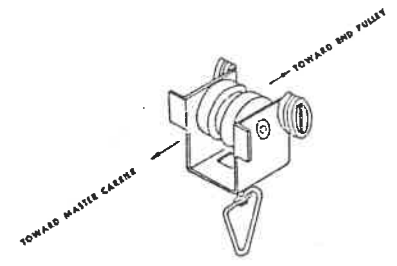
TITLE PIG LEPRICON INTERFACE
FOR
DATE 11-91
SCALE —
DRAWN BY DBC
APPROVED BY
DWG. No. —

MODEL 140
METHOD OF INSTALLATION



IMPORTANT NOTES:

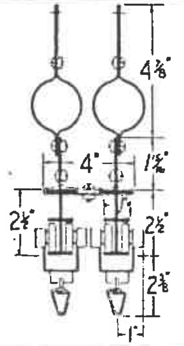
1. It is most important that track channel not be curved to radius of under 2'. On curves with radii of under 2', carriers should be spaced much more frequently than the standard 12".
2. Two No. 4225 Rubber Bumpers should be attached to each carrier to function as noise reducers, one to be placed on each of the two flanges facing the nearest end pulley.
3. On certain installations, especially where sharp curves and very light curtains are involved, it may be necessary to attach chain horizontally between carriers to provide a means of proper carrier spacing to prevent possible tipping or jamming of carriers particularly as they traverse the curved areas.
4. The span between hanging clamps should never exceed 4 feet; for ceiling clamps, 5'. For most effective installation, ceiling clamps should be used rather than hanging clamps. Clamps should be liberally used at splices and curves.
5. Track channel is punched every 6" along its entire length to accommodate idlers or spindles where needed.
6. Make certain when bending track channel that the punched holes are at top of channel.
7. 1¼" stiffening pipe or the equivalent is recommended to support both straight and curved areas of all suspended curved track. Reverse curves cannot be used with this track.
8. Install No. 1309 End Stop in front of Live End Pulley.
9. Our No. 3529 Cable should be used with all motor-operated curved tracks.



METHOD OF ATTACHMENT OF NO. 4225 RUBBER BUMPERS

NOTE: For determining necessary amount of curtain packing space, width of No. 4201 Single Carrier is approximately 1⅜"; No. 1402 Master Carrier approximately 3¾"; No. 1403 Live End Pulley approximately 7"; No. 1404 Dead End Pulley approximately 5¼".

CROSS SECTION
OF TRACK AT
CENTER OVERLAP



AUTOMATIC DEVICES CO.
Allentown, Penna.

ASSEMBLY DRAWING FOR
Model 140 Rig-I-Flex
Curved Track

T-1559

ADC FORM 743 7-83 1M
PRINTED IN USA

SUGGESTED IDLER AND SPINDLE SPACING ON CURVED #140 RIG-I-FLEX TRACKS

RADIUS OF CURVE	APPROX. SPINDLE SPACING	APPROX. NO. REQUIRED IN 90 CURVE
2'	12"	4
3'	12"	5
4'	18"	5
5'	18"	6
6'	24"	6
7'	24"	6
8'	36"	6
10'	42"	7
12'	42"	7
14'	48"	7
16'	48"	7
18'	60"	7
20'	60"	7
22'	72"	7
24'	72"	8
26'	72"	8
28'	84"	8
30'	84"	9
32'	84"	9
36'	84"	10
40'	84"	11
44'	84"	11
48'	84"	12
52'	84"	13
56'	84"	14
60'	84"	15
64'	84"	16

NOTES:

1. On bi-parting tracks, where track is straight at the overlap, an equal number of #1458 Spindle A, #1459 Spindle B and #1460 Idler Brackets are used. For example, a bi-parting track, straight at the overlap, with two 90 degree 6' radius curves, would require six each of the #1458 Spindle A, #1459 Spindle B and #1460 Idler Bracket. Refer to ADC Form 743.

2. On bi-parting tracks curved through the overlap, the #1459 Spindle B is used between the track channels. On tracks of this type, special lap clamps must be used to keep the tracks 4" apart instead of the normal 2-1/2" spacing, where tracks are straight through the overlap. One #1460A Idler Bracket is used at the overlap to prevent the cord from rubbing the cut end of the track channel. Refer to ADC Form 745.

3. On one-way draw tracks, only the #1458 Spindle A is used, since both cords will be on the inside of the curve. When this type of track is installed, the dead-end pulley wheel is mounted on the side of the bracket, rather than on the bottom.

4. Due to cord sag, we do not suggest a spacing greater than 84".

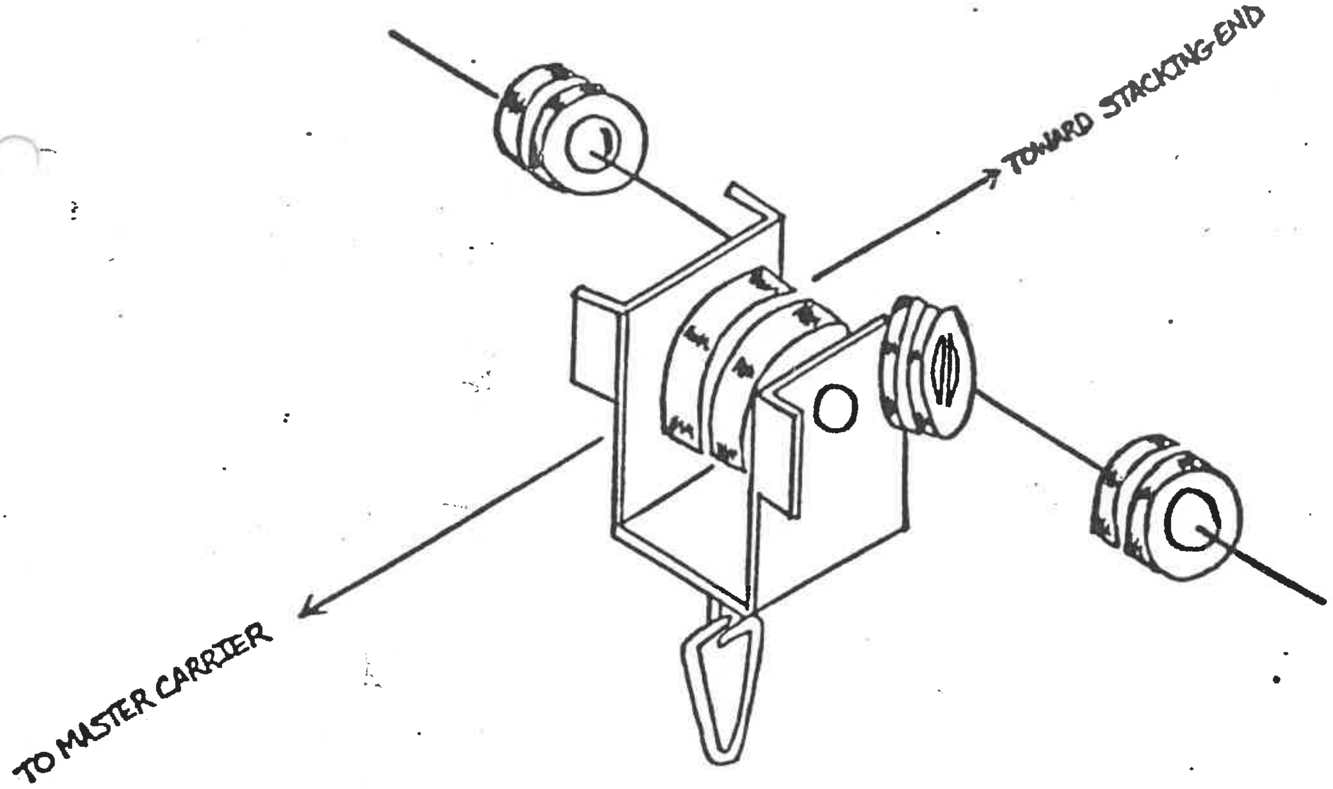
ADC FORM 442
June, 1987

OPTIONAL RUBBER BUMPERS FOR #4201 AND #4237 SINGLE CARRIERS

Rubber Bumpers are supplied in a separate bag for attachment to the above-mentioned single carriers, should the customer so decide.

Please note that with these bumpers attached, each carrier will require approximately one quarter inch (1/4") of additional stacking space.

To attach the bumpers, merely slide them over the metal bumper portion of the carrier block, as shown in the illustration below. Press the bumper over either the upper or lower edge and then press toward the other edge. A bumper is placed on each of the two flanges facing the nearest pulley.



INSTALLATION INSTRUCTIONS FOR RIG-I-FLEX CURVED TRACK MODEL 140

After track is curved and ready for overlapping at center, make certain that the live-end section of the track is overlapped over the OUTSIDE of the curve of the dead-end section pulley.

Then proceed as follows:

Attach live-end pulley with wheels on inside of curve and top wheel nearest the end of track (two sets of holes are punched in live end bracket for right or left hand pull). Next, install a No. 1309 End Stop in front of the live-end pulley. Then attach the dead-end pulley.

Insert single carriers and master carriers, then attach combination end stop cord hook. When inserting master carrier in track, make certain that the single wheel of the carrier is on the inside of the curve. On swivel type four-wheel master carriers, make certain that cord connector is on the inside of the curve. Track is punched every 6" along its entire length to accommodate idlers or spindles where needed (see drawing).

Attach spindles and idlers as shown; this will vary according to the type of installation. Spindle A is always placed on the live-end pulley track section on the inside of the curve. Spindle B is always placed on the dead-end pulley track section on the inside of the curve. The idler bracket is always placed on the dead-end pulley track section on the outside of the curve.

Next, thread one end of cord over the top wheel of live-end pulley, then around the idler wheels on top of the spindle brackets inside of curve, then along the track over the end stop cord hook at the lap end of the other section of track, and then through the connectors on the master carrier of the other section of track (do not tighten screws as yet).

Then, thread the cord around the spindles inside of the curve, around the dead-end pulley, then back around the idler pulleys on the outside of the curve and back to the nearest connector of the master carrier on the first half of track and fasten cord.

Next, thread the other end of cord through the floor pulley and over the bottom wheel of the live-end pulley and around the spindles on the inside of the curve and to the other connector of the master carrier. Then remove the slack and tighten the connector.

Next, move this master carrier to the end of the track to the center lap, move the other master carrier to the same spot on its half of track and tighten the connectors.

Track is then ready to hang curtain.

(OVER)

POST THIS CARD AT CONTROL SWITCH

CAUTION

1. On ALL MODELS always allow a time interval of at least 5 seconds between switch operations to permit motor to come to complete STOP before reversing.

2. Most of our controls are equipped with intermittent duty motors and their continued operation must be limited. Otherwise, motors will overheat and the thermal protectors will cut out.

3. This motor control is guaranteed against defective material and workmanship for a period of one year from the date of shipment. Any unauthorized repairs or adjustments made on this control automatically voids this guarantee.

AUTOMATIC DEVICES CO.

ADC DRAPERY TRACK CORPORATION

ALLENTOWN, PA.

CAUTION

This gear reducer has been filled with the proper amount of lubricant, sealed, and carefully checked for leakage before shipment. If the unit is to be mounted in a location where leakage will be a problem, we suggest that the reducer be carefully examined for leakage before installation. If the unit is to be inverted when installed, we suggest that the entire assembly be placed in an inverted position, for some time, to determine if leakage will occur.

Should the reducer show evidence of leakage this problem should be corrected before final installation. ADC cannot be responsible for leakage once the unit has been installed.

NOTE: The reducer was approximately one-half full of lubricant when shipped. Adding additional lubricant can cause seal and gasket failure in unvented reducers. Should lubricant be required in the future, add AGMA #8 lubricant to one-half level and reseal the fill plug. The original lubricant was Mobil 600W Super Cylinder Oil and is available from ADC.

AUTOMATIC DEVISES COMPANY
ALLENTOWN, PA

MAINTENANCE CHECK LIST
for
ADC CURTAIN MACHINES

If the few simple rules listed below are carefully followed, your curtain machine should render efficient and troublefree service for many years.

1. When setting limit switches, make certain that the motor shuts off before the carriers hit the ends of the track.
2. Make certain that when cable is wound around grooved drum, excess slack is removed. Cable should not be too taut.
3. On machines with a fuse for overload protection the fuse should never be replaced with one having a higher ampere than the original fuse.
4. On machines equipped with a belt drive, the belt should always be reasonably taut. Adjustments can be made by lowering or raising the locking nut on the motor mounting.
5. Motor should be oiled as per manufacturer's instructions on motor.

ADC FORM 322 8-87 1M

PRINTED IN U. S. A

Book

NSI DIGITAL DIMMING SYSTEM

DDS 6000 DIMMER PACK

INSTALLATION AND OPERATION GUIDE

Software Revision 1.0, Version A

INTRODUCTION

The NSI DDS 6000 represents a key part of a state of the art, integrated lighting control system. These dimmers may operate in a "stand alone" mode for automated lighting of displays or may be combined with an NSI memory lighting console for total lighting control.

The DDS 6000 provides four channels of 1200 watts each. This dimmer is designed for portable or semi-permanent use for entertainment or display lighting. Several DDS dimmer packs may be combined for more channels of lighting.

SPECIFICATIONS

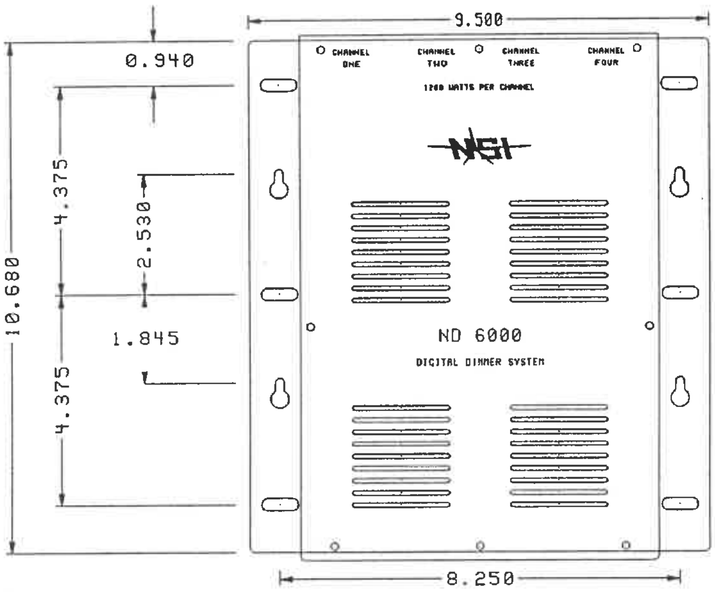
Number of Channels:	4
Output capacity:	1200 watts per channel.
Input Power:	120 VAC 2400 watts max (one power source)
Dimmer control system:	Microprocessor digital phase control dimming or zero-crossing relay mode.
Load filtering:	~ 400us rise time.
Control Input Types:	0 - 10VDC each channel on 5 pin din connector. MICROPLEX multiplex signal (128 channel) on three pin XLR type connector. DMX-512 digital signal (512 channel) on five pin XLR optional.
Control Wiring:	Class 2 low voltage.
Output Connections:	2 NEMA 5-15 outlets per channel.
Cooling System:	Passive internal aluminum heatsinks.

MOUNTING

The NSI DDS 6000 dimmer pack is designed to be mounted **VERTICALLY.** Each dimmer pack is provided with two mounting flanges or ears designed for securing to the center of truss bars or attaching to other vertical surfaces.

Since the DDS 6000 depends upon convection cooling, room air flow must be insured. Keep the air vents located on each side of the dimmer pack clear of dust or any obstructions.

If several units are to be operated in a small enclosed room, adequate ventilation must be provided to prevent the room temperature from exceeding 100 degrees fahrenheit



AC POWER CABLE.

This is the main power cord for your dimmer pack which ultimately carries all of the ac power consumed by lights connected to the dimmer pack. It must be connected to a power source capable of supplying the total power drawn by the lights. (See specifications for details on maximum power capability.)

WARNING: Do not remove grounding prong of AC plug. To do so may allow exposure to potentially lethal voltage levels and will void the warranty on this product.

AC OUTPUT RECEPTACLES

The DDS 6000 has two AC receptacles for each channel. These receptacles provide power to the lamps in your lighting system. The amount of power supplied to these outlets controls the intensity of the lamps connected.

The total lamp wattage connected to each channel must not exceed the rating of each channel (see specifications). Most 120VAC lamps and fixtures and some transformer type low-voltage fixtures may be connected to these outlets, DO NOT connect motors or fluorescent lighting to these outlets when channel is operating in dimmer mode.

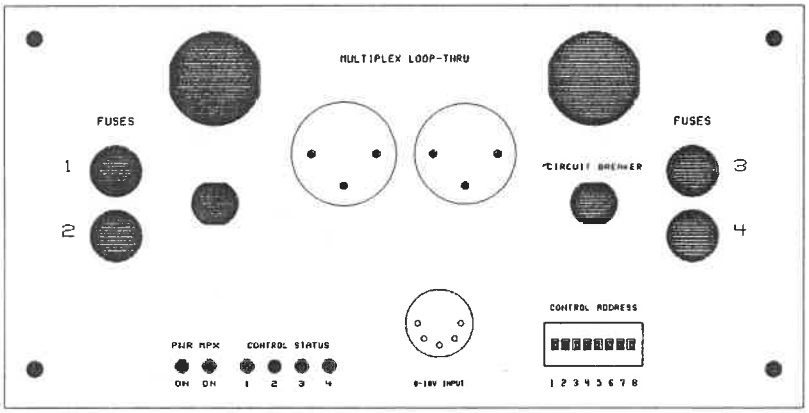
NOTE: Some inductive type loads such as transformers, ballasts, and motors, with poor power factor may cause the dimmer to output D.C. type current. This may cause the load to draw excessive current and overheat, causing damage to the transformer, ballast, or motor. For this reason, it is necessary to insure any inductive loads are fused individually for their respective normal operating current.

MICROPLEX MULTIPLEX CONTROL WIRING.

Microplex is the control protocol used on most NSI lighting consoles. This system uses a single three conductor cable to transmit up to 128 channels of dimmer control. For short distances (50 feet or less) a standard microphone cable may be used to carry both the control signal and the DC power source for NSI control consoles. Longer distances may be accommodated with 18 gauge or better cable to reduce voltage losses of the power supply.

Connect the Microplex control cable to either of the three pin XLR jacks. Since both jacks are wired in parallel, another control cable may connected between the remaining jack and another dimmer pack. Many dimmer packs may be "daisy chained" together in this manner.

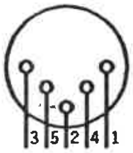
Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).



ANALOG 0 - 10 VDC CONTROL WIRING.

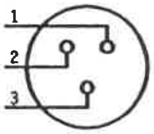
Each of the four dimmer channels of the DDS 6000 may be operated by an analog 0 - 10 VDC control voltage. This type of control will provide 0% intensity at 0 volts and 100% intensity at 10 volts. Any or all of the DDS 6000 dimmer channels may be operated in this manner simultaneously with any multiplex control input. Each dimmer will respond to the greater of any control inputs.

The analog control input uses a standard 5 pin DIN plug which is available from most electronics supply houses. Connect each of the positive channel control wires to the desired dimmer channel input pins (see diagram) of the plug. Connect the common (ground) control wire to the pin indicated on the diagram. Consult the documentation of the analog control console or device you are using for the proper connections. The control input impedance is 4.7K ohms.



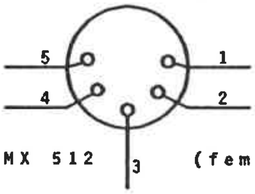
0-10v input

2: common
3: chan 1
5: chan 2
4: chan 3
1: chan 4



Microplex
(female)

1: common
2: +15v
3: data



DMX 512 (female)

1: common
2: data -
3: data +

4-5: not used

DMX-512 multiplex control wiring.

DMX 512 is the United States Institute of Theater Technology (USITT) standard for the digital control of dimmers. NSI DDS Dimmer products can be converted from Microplex to DMX 512 digital multiplex with a simple kit available from your dealer.

DMX-512 is the preferred type of control wiring when many dimmer channels are used, because of the high update rate and the resistance to interference. It is recommended in locations subject to electrical noise. DMX-512 only requires 3 wires to transmit lighting levels for as many as 512 dimmer channels. Most of the NSI lighting control consoles can optionally use this interface.

Connect the DMX 512 cable from the control console to the male input connector. Another cable may be connected from the female connector to the male connector on another pack. Many dimmer packs may be "daisy chained" connect together in this manner.

Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).

LED INDICATORS

The front panel indicator LEDs indicate the status of the dimmer.

- RED - Indicates the firing card is receiving DC power.
- GREEN - Steady indicates a multiplex control signal is being received.
- YELLOW - Indicates a respective dimmer channel is active and the LED indicates relative intensity.

AUTO LAMP TEST

Whenever dipswitch #8 is in the off (down) position and there is no multiplex signal detected, all channel outputs will come to full intensity. The automatic sequencing feature must be disabled for this Auto Lamp test to operate (see INTERNAL JUMPER SELECTIONS).

CHANNEL FUSES

Each channel is protected by a fuse to help prevent overload and damage to the power control devices used in the dimmer. Be sure to replace the fuse with the same type and rating. Replacement with the wrong fuse is dangerous and will void your warranty.

Note: Lamps may sometimes cause a temporary "short-circuit" when the filament burns out and cause the fuse to blow. This is normal and protects the internal dimmer circuitry from damage.

INSTALLATION and OPERATION TIPS

Care should always be taken to:

1) Keep all AC wiring away from control wiring.

2) We also recommend powering up and performance checks be done one unit at a time. This can be a real time saver should problems arise thus eliminating unnecessary isolation techniques to resolve problems

SWITCH SETTINGS

When using any of the multiplex control systems the dip switches on the front panel of the DDS 6000 must be set to assign the desired dimmer channels. The switches control the dimmer channels in groups of four. See the following chart for settings.

DIP SWITCH CHANNEL ASSIGNMENTS

CONTROL	1234567	CONTROL	1234567	CONTROL	1234567
1-4	0000000	5-8	1000000	9-12	0100000
13-16	1100000	17-20	0010000	1-24	1010000
25-28	0110000	29-32	1110000	33-36	0001000
37-40	1001000	41-44	0101000	45-48	1101000
49-52	0011000	53-56	1011000	57-60	0111000
61-64	1111000	65-68	0000100	69-72	1000100
73-76	0100100	77-80	1100100	81-84	0010100
85-88	1010100	89-92	0110100	93-96	1110100
97-100	0001100	101-104	1001100	105-108	0101100
109-112	1101100	113-116	0011100	117-120	1011100
121-124	0111100	125-128	1111100	129-132	0000010
133-136	1000010	137-140	0100010	141-144	1100010
145-148	0010010	149-152	1010010	153-156	0110010
157-160	1110010	161-164	0001010	165-168	1001010
169-172	0101010	173-176	1101010	177-180	0011010
181-184	1011010	185-188	0111010	189-192	1111010
193-196	0000110	197-200	1000110	201-204	0100110
205-208	1100110	209-212	0010110	213-216	1010110
217-220	0110110	221-224	1110110	225-228	0001110
229-232	1001110	233-236	0101110	237-240	1101110
241-244	0011110	245-248	1011110	249-252	0111110
253-256	1111110	257-260	0000001	261-264	1000001
265-268	0100001	269-272	1100001	273-276	0010001
277-280	1010001	281-284	0110001	285-288	1110001
289-292	0001001	293-296	1001001	297-300	0101001
301-304	1101001	305-308	0011001	309-312	1011001
313-316	0111001	317-320	1111001	321-324	0000101
325-328	1000101	329-332	0100101	333-336	1100101
337-340	0010101	341-344	1010101	345-348	0110101
349-352	1110101	353-356	0001101	357-360	1001101
361-364	0101101	365-368	1101101	369-372	0011101
373-376	1011101	377-380	0111101	381-384	1111101
385-388	0000011	389-392	1000011	393-396	0100011
397-400	1100011	401-404	0010011	405-408	1010011
409-412	0110011	413-416	1110011	417-420	0001011
421-424	1001011	425-428	0101011	429-432	1101011
433-436	0011011	437-440	1011011	441-444	0111011
445-448	1111011	449-452	0000111	453-456	1000111
457-460	0100111	461-464	1100111	465-468	0010111
469-472	1010111	473-476	0110111	477-480	1110111
481-484	0001111	485-488	1001111	489-492	0101111
493-496	1101111	497-500	0011111	501-504	1011111
505-508	0111111	509-512	1111111		

When the automatic sequencing feature is operating, the dip switch selects the operating sequence pattern and speed. See the section on INTERNAL JUMPER SELECTION for details.

INTERNAL JUMPER SELECTIONS

Caution: The follow procedures should be performed by qualified personnel only.

Remove all power and remove the cover of the dimmer pack. Locate and change jumper settings on the firing card as indicated in the following section.

Softstart

The Softstart mode of operation forces at least a 1/10th second delay between the output being full off to the output being full on to allow a more gradual warming of the lamp filaments. Thermal shock and inrush currents are reduced thereby increasing lamp life. Softstart should not be used when quick dimmer response is desired such as chasing.

To activated Softstart; remove the jumper block from the pin marked P2 on the firing card. Replacing the jumper block will deactivate Softstart.

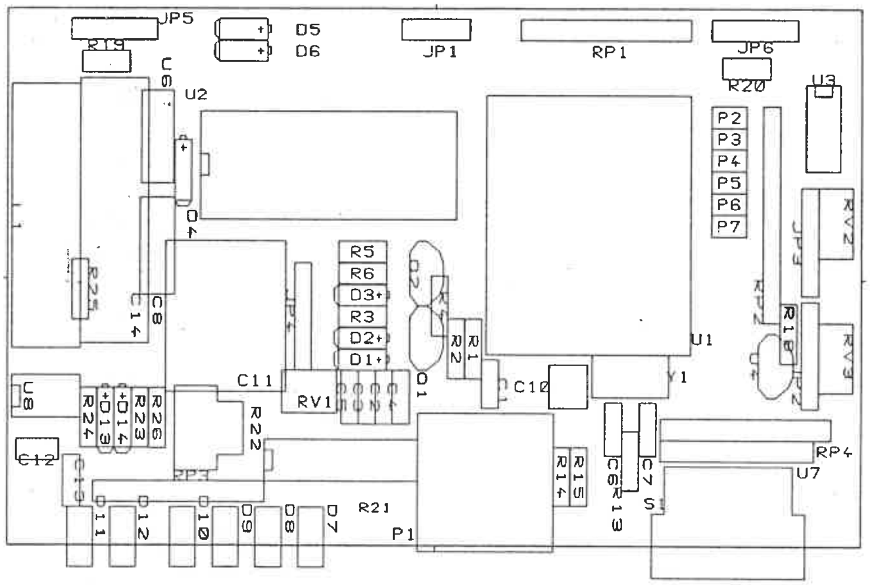
NOTE: The channels of the DDS 6000 configured for NON DIM operation will not be affected by softstart.

Non Dim Channels (Relay Mode)

Any of the channels of the DDS 6000 may be configured as NON DIM channels. This will cause the output of the channel to go to full on whenever the input signal is over 15%. When the input signal drops to less than 10%, the channel output goes to full off. This is the equivalent of a zero-crossing solid state relay.

To configure a channel for NON DIM operation simply remove the jumper block from the pins on the firing card as indicated. Replacing the jumper block will restore dimming operation.

CHANNEL	JUMPER BLOCK	CHANNEL	JUMPER BLOCK
1	P4	2	P5
3	P6	4	P7



AUTO SEQUENCING MODE

The DDS 6000 dimmers can be configured to perform stand alone Automatic Sequencing in place of Auto Lamp Test. This is useful for lighting displays and show windows. The four channels will automatically fade from one to another in a preprogrammed pattern and time selected by the front panel dipswitch whenever dipswitch #8 is up and no multiplex signal is detected. The Analog control input will continue to operate while the dimmer is sequencing.

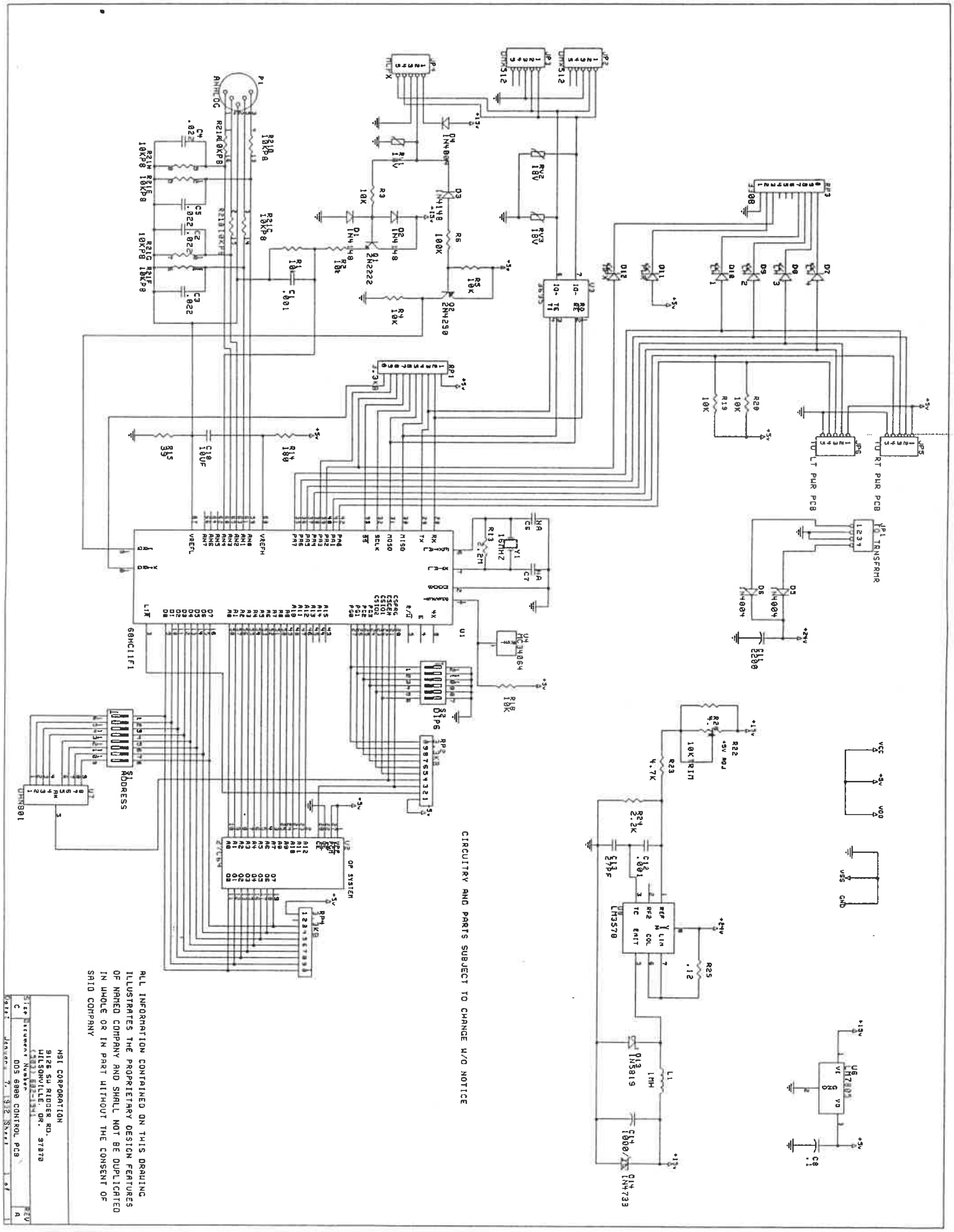
To enable Automatic Sequencing Mode remove jumper from position P3.

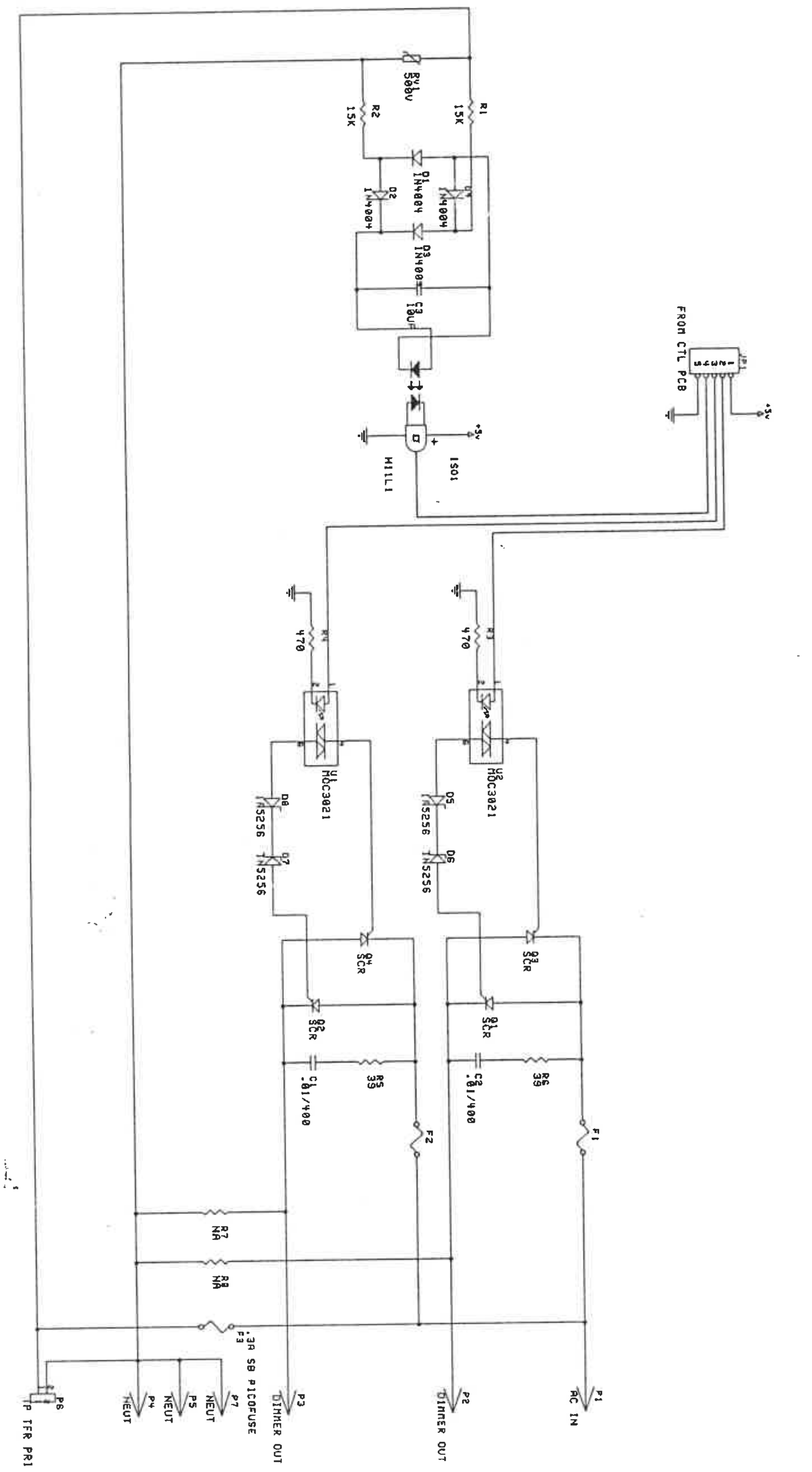
Dipswitch settings

STEP TIME	SWITCH 1,2,3	PATTERN	SWITCH 4,5,6
1 SECOND	OFF,OFF,OFF	2 CHAN BUILD	OFF,OFF,OFF
3 SECOND	ON,OFF,OFF	3 CHAN SEQUENCE	ON,OFF,OFF
5 SECOND	OFF,ON,OFF	3 CHAN BUILD	OFF,ON,OFF
10 SECOND	ON,ON,OFF	2&4 CHAN ALT	ON,ON,OFF
15 SECOND	OFF,OFF,ON	4 CHAN SEQUENCE	OFF,OFF,ON
30 SECOND	ON,OFF,ON	4 CHAN BUILD	ON,OFF,ON
45 SECOND	OFF,ON,ON	4 CHAN BUILD +	OFF,ON,ON
60 SECOND	ON,ON,ON	4 CHAN RANDOM	ON,ON,ON

Dipswitch # 7 on causes all above sequences to ping-pong.

Service Information





CIRCUITRY AND PARTS SUBJECT TO CHANGE WITHOUT NOTICE

ALL INFORMATION CONTAINED ON THIS DRAWING
ILLUSTRATES THE PROPRIETARY DESIGN FEATURES
OF NAMED COMPANY AND SHALL NOT BE DUPLICATED
IN WHOLE OR IN PART WITHOUT THE CONSENT OF
SAID COMPANY

NSI CORPORATION
9126 SW RIDDER RD.
WILSONVILLE, OR. 97070
(503) 682-1941

Size	Document Number	REV
C	DDS 6000 POWER PCB	A
Date: January 7, 1992	Sheet 1 of 1	

WARRANTY

NSI Corporation Limited Warranty

NSI Corporation warrants new electronics products to be free from defective materials and workmanship for a period of one (1) year from the date of purchase to the original owner when purchased from an authorized NSI dealer.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse, or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks, and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer. Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

NSI Corporation is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.

OPERATING INSTRUCTIONS & PARTS MANUAL

TIME DELAY RELAYS

MODELS 5X828F THRU 5X830F, 6X153F THRU 6X155F & 6X601F THRU 6X605F

FORM
5S1133
07038

0789/344/1M

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR SERVICE DAYTON TIME DELAY RELAYS. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!

RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Description

Dayton time delay relays combine solid state digital timing circuits with an electromechanical relay for control of loads. Applications include pilot duty control, and limited inductive circuits (motor loads). Relays are not to be used to directly switch tungsten lamps or other high inrush current loads. Time delay relays are UL Recognized (E40944) and CSA Certified (15734).

Specifications

Input volts	120VAC ± 10%; 50/60 Hz
Repeatability	±1% @ 25°C
Reset time	50 ms max.
Power consumption	3 VA max.
Contact configuration	DPDT (2 Form C)
Contact rating	10 Amp res. @ 120VAC 10 Amp res. @ 30VDC 1/3 HP @ 120/240VAC
Transient protection	1 Joule; MOV
Temperature range	Operation − 10°F to +130°F Storage − 10°F to +160°F

MODEL	ON DELAY TIMING RANGE	SOCKET NO.
5X828F	0.1 to 10 sec.	5X852A
5X829F	1.8 to 180 sec.	5X852A
5X830F	3 to 300 sec.	5X852A
6X601F	9 to 900 sec.	5X852A
	OFF DELAY	
6X153F	0.1 to 10 sec.	6X156B
6X154F	1.8 to 180 sec.	6X156B
6X155F	3 to 300 sec.	6X156B
6X602F	9 to 900 sec.	6X156B
	INTERVAL	
6X603F	0.1 to 10 sec.	5X852A
6X604F	1.8 to 180 sec.	5X852A
6X605F	3 to 300 sec.	5X852A

Dimensions

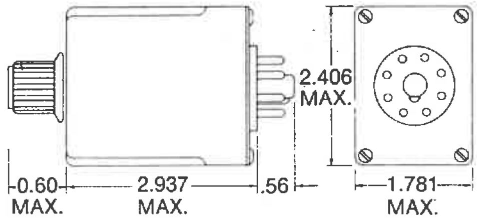


Figure 1

General Safety & Installation

WARNING: DISCONNECT POWER WHEN CONNECTING OR DISCONNECTING THE TIME DELAY RELAY OR ITS LOADS.

1. The time delay relay should be wired by qualified personnel according to the National Electrical Code (NEC) and local codes.
2. Do not connect input or contact terminals to voltages higher than those indicated on time delay relay.
3. Protect the coil and load circuits with properly rated fuses.
4. Do not install in damp or moist locations.
5. When installing control switch, shielded wire should be used when running close to other wires. Control switch should be a low level pilot duty type. Control switch circuit must be isolated from ground, neutral, or any other voltage source.
6. Any application of this time delay relay should be designed to prevent bodily injury, or property damage, in the event of product failure or normal wearout of this product.
7. A lockable disconnecting means should be provided to disconnect relay and relay-driven devices from all ungrounded power supply. The disconnecting means should plainly indicate whether it is in open OFF or closed ON position.
8. Relays have a finite life. Normal failure modes include contact sticking and improper operation. Installations where property damage and/or personal injury might result due to the possibility of improper operation require further installation of back up systems.
9. Timing range dial is for reference point only and may not be to the exact timing range required.

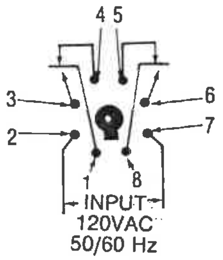


Figure 2

Operation

On Delay: Upon application of voltage to input terminals, time delay period begins. At end of time delay period, output contacts transfer, either connecting or disconnecting load. Reset is accomplished by removing input voltage.

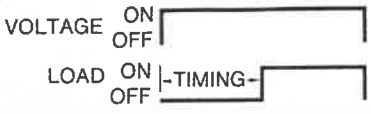


Figure 3

Operation (Continued)

Interval: Upon application of voltage to input terminals, output contacts transfer and time delay period begins. At end of time delay period, contacts transfer back, either connecting or disconnecting load. Reset is accomplished by removing input voltage.

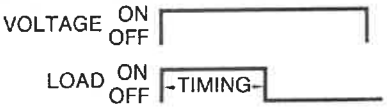


Figure 4

Off Delay: Voltage is to be applied to input terminals at all times that this product is in use. Upon closure of control switch, output contacts transfer. Once control switch is "opened", time delay period begins. Control switch closures prior to end of time delay period will immediately reset timer. At end of time delay period, output contacts will transfer back to their original positions, and timer is ready for a new cycle.

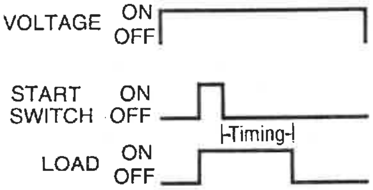


Figure 5

APPLICATIONS

On Delay, refer to Figure 6.

1. Voltage is applied to pins 2 and 7.
2. The common terminals, pins 1 and 8, are connected to pins 2 and 7.
3. Load B is activated through pins 4 and 5 (normally closed contacts).
4. After time delay period ends, output relay energizes and contacts transfer to pins 3 and 6, activating load A (normally open contacts).
5. Reset timer by removing voltage from pin 2 or 7.

Interval, refer to Figure 6.

1. Voltage is applied to pins 2 and 7.
2. The common terminals, pins 1 and 8, are connected to pins 2 and 7.
3. Output relay energizes and contacts transfer to pins 3 and 6, activating load A (normally open contacts).
4. Time delay period begins.
5. After time delay period ends, output relay de-energizes and contacts transfer back to pins 4 and 5, activating load B (normally closed contacts).
6. Reset timer by removing voltage from pin 2 or 7.

Off Delay, refer to Figure 7.

1. Voltage is applied to pins 2 and 10.
2. The common terminals, pins 1 and 11, are connected to pins 2 and 10.
3. Load B is activated through pins 4 and 8 (normally closed contacts).
4. Once control switch is closed, output relay energizes and contacts transfer to pins 3 and 9, activating load A (normally open contacts).
5. When control switch is "opened", time delay period begins.
6. Any control switch closures prior to end of time delay period will reset timer.
7. At the end of time delay period, output relay de-energizes and contacts transfer back to pins 4 and 8, activating load B (normally closed).
8. Begin new cycle with control switch closure.

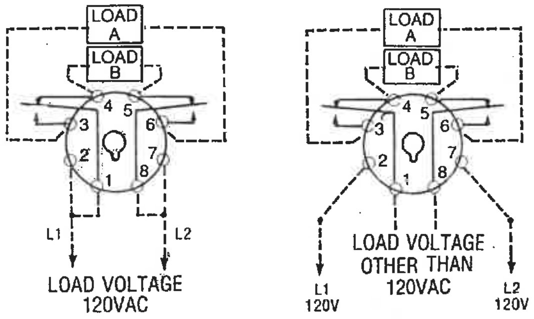


Figure 6

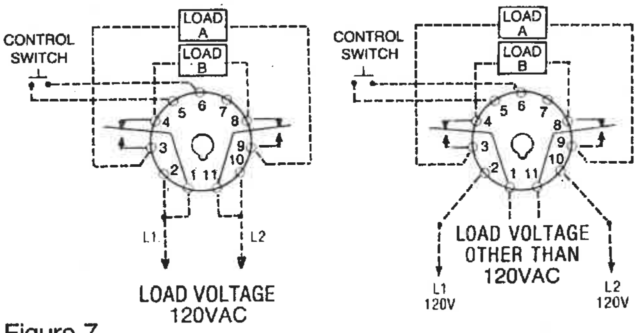


Figure 7

Troubleshooting

Should relay fail to operate, check all connections to relay and control circuits, verify that proper voltage connections are made, and check all fuses. For OFF delay relays, be sure that control switch is connected to pins 5 and 6 of the socket.

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Time delay relays, Models 5X828F thru 5X830F, 6X153F thru 6X155F & 6X601F thru 6X605F, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specified legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of the Limited Warranty, any implied warranties of merchantablility or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

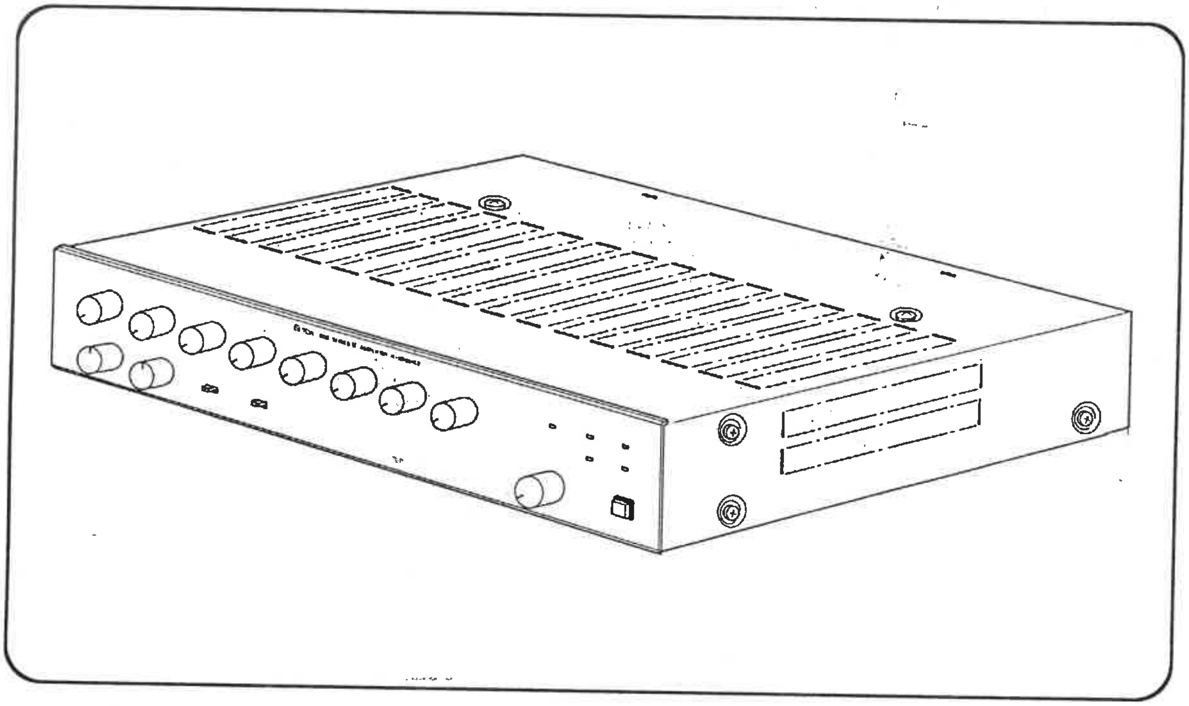
Manufactured for Dayton Electric Mfg. Co.,
5959 W. Howard St., Chicago, IL 60648

TOA

Operating Instructions

TOA 900 SERIES II
MIXER POWER AMPLIFIER

A-903MK2
A-906MK2
A-912MK2



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

THE LIGHTNING FLASH WITH ARROWHEAD WITHIN A TRIANGLE IS INTENDED TO TELL THE USER THAT PARTS INSIDE THE PRODUCT ARE A RISK OF ELECTRIC SHOCK TO PERSONS.

THE EXCLAMATION POINT WITHIN A TRIANGLE IS INTENDED TO TELL THE USER THAT IMPORTANT OPERATING AND SERVICING INSTRUCTIONS ARE IN THE PAPERS WITH THE APPLIANCE.

Please follow the instructions in this manual to obtain the optimum results from this unit. We also recommend that you keep this manual handy for future reference.

TOA Corporation

QSC®

AUDIO

MX
SERIES
POWER
AMPLIFIERS

MX 700
OWNERS
MANUAL

TASCAM

TEAC Professional Division

134/134B

SYNCASET

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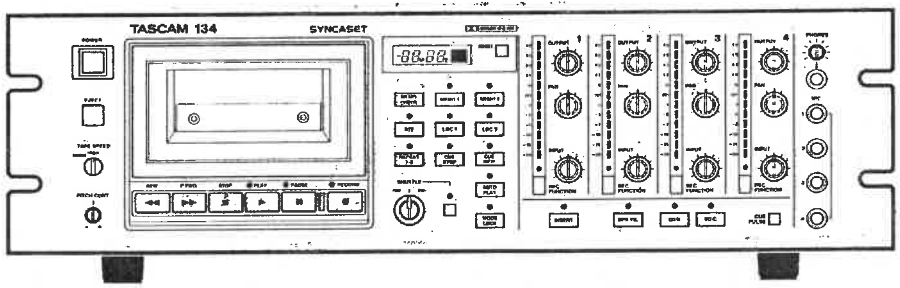

OWNER'S MANUAL

5700137101

CARE AND MAINTENANCE OF JETHRO FOR CELEBRATION STATION

Regular cleaning and maintenance of your characters is essential to keep your show looking new and characters running smoothly.

Cleaning JETHRO:

Jethro should be dusted regularly, i.e. weekly, monthly, etc.

To dust Jethro use a feather duster or blow off characters with an air hose set at 50 or 60 psi of air pressure. Remember to brush fur with a hair brush back to original condition.

Mask and Hands : Wash characters with a mild solution of cleaner and water. (We suggest Top Job) Using a sponge or soft cloth that has been dipped in the soapy water, gently wash the soiled area. **DO NOT SCRUB.** This may lift the paint. Pat dry with a soft dry cloth. DO NOT submerge mask or use excessive amount of water. Remember to cover the character's costume, or remove it before washing mask to protect it. If you notice worn spots in the mask, these can usually be repaired with touch-up paint if the damage is not very extensive.

Costume

Regular dusting and maintenance of Jethro is the easiest way to keep him clean and looking great.

To clean stains and spots on Jethro's costume, use spot remover on soiled areas.

Jethro's costumes can be dry cleaned if it becomes very dirty. The costume is easily removed due to the velcro seams. Overalls open at the back and the inseam. Shirt opens at the back and under both arms.

REPAIRING TEARS IN THE SILICONE

1. Clean the surface to be repaired with alcohol, or a weak solution of *Top Job* (1/4 cup of cleaner per gallon of water) and dry thoroughly.
2. Using a t-pin, place a small amount of silicone on the inside of the tear (wipe excess off outer surface).
3. Close the tear with small straight pins; again wipe excess off outer surface.
4. Allow 15-20 minutes for silicone to cure. Do not move character or touch curing silicone. If the tear is still visible, follow steps #1-4 again.
5. On a clean, lint-free surface, mix a small amount of powder pigment (about the size of a pea) with silicone (about the size of a silver dollar). Mix well with craft sticks. Be careful; silicone will become stiff and lumpy if stirred for too long. If this happens, do not use ... mix up a new batch.
6. Spread silicone over tear in a thin layer. Be sure to cover the entire damaged area.
7. Dip a finger in alcohol and smooth the surface. Rub the edges in to the existing skin for a smooth transition and to help disguise the repair.
8. Dip a make-up sponge in alcohol (saturate it well) and then pat on the fresh silicone layer. The sponge ill give the repair a textured surface that more closely resembles skin. Do not press too firmly with the sponge as this will pull up the silicone layer. Don't be afraid to use too much alcohol.
9. Now apply loose face powder. Dip a brush into the powder. Hold the brush 3-4 inches from the repaired area and blow powder on to the repaired surface. Powder will go everywhere, but can be easily removed with alcohol, once the repair has completely cured.
10. Leave the repair alone. It is crucial that the character does not move and that nothing touches or rubs the area for the next 10-12 hours (depending on how bad the area was damaged). Repairs to the face and neck should cure for 12 hours. Repairs to the hand, if not severe, should cure for 8-10 hours.

If you have any questions or problems, please call (904) 353-5051, Monday - Friday, 8:00 a.m. - 5:00 p.m. (EST) and ask for Kathy Seil, Art Department. After business hours or on weekends & holidays, call (904) 443-6900 and leave a message (including your name, a number where you can be reached, and a description of your problem).